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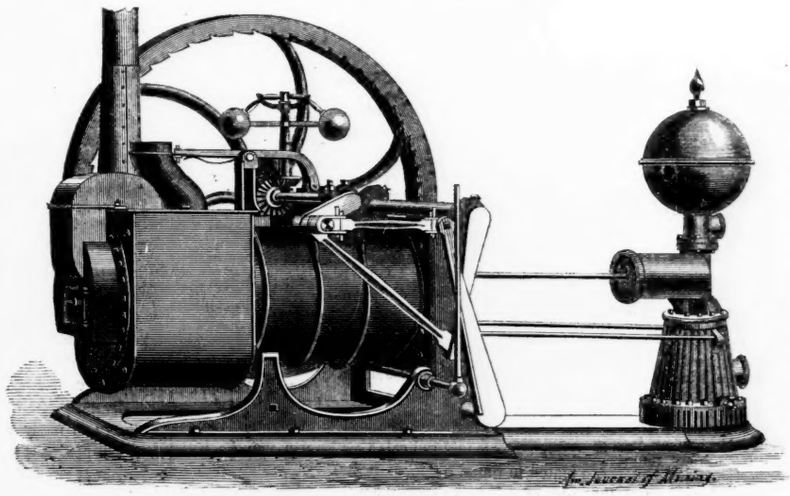
THE ERICSSON CALORIC ENGINE.

The principle of this engine, known by the name of atmospheric, caloric, or hot-air engine, according to the prominence of our idea of air or heat as the chief agent, has been known for a considerable time to engineers. As early as 1824 a patent for an atmospheric engine was granted in the United States. Franchot, and many other eminent men have devoted considerable attention to it, but to Ericsson the credit of its improvement is mainly due. Its object is to use as a motive power by means of air, heat. The princip of its construction is now very much simplified. In the machine which we illustrate this week—a horizontal caloric engine with pump attached—the air is drawn into the heating chambers by means of the supply piston which works with a quick, steady motion, through the main or working piston. The supply piston is worked by a lever hung out of centres. The return motion of both pistons is effected by the action of the fly wheel. Simultaneously with the introduction of the fresh air, the heated air having done its work is exhausted, and this new supply brought in contact with the heated surfaces expands, forcing out the piston, thus completing the revolution of the fly-wheel. A governor valve regulates the speed, by allowing the escape of compressed air. This engine can be used in many cases where steam has hitherto been the moving power, as in pumping, printing, hoisting, grinding, propelling, &c., and for these and other purposes we recommend it to the attention of our readers. In another column will be found a certificate from A. F. Smith, Esq., General Superintendent of the Hudson River Railroad, who has had a number in use several years "raising water different heights from twenty-two to eighty feet, and in one case drawing and forcing it more than 1,500 feet horizontally, in addition to the elevation." Mr. Smith adds: "My own judgment is that the 'hot air engine,' as now constructed, its capacity being properly suited to its work, affords the most economical, and in every respect the best power attainable." The advantages claimed for it are, absolute safety from explosion, economy in the production of power, and in the consumption of fuel. It does not require skilled laborers to work it. It is still more important in the directing impulse it has given to invention. J. A. Robinson, of 164 Duane street, is the manufacturer, to whom we refer our readers for all business details in connection with these engines and pumps.



THE ERICSSON CALORIC ENGINE AND PUMP.

Explosions in Coal Mines, &c.

Mr. William Rennoldson, an Englishman, proposes the following plan, or scheme, for perfectly and sufficiently ventilating coal mines and other subterraneous workings: He suggests to use steam power at the surface to drive a large air engine, with air receiver and pipes, &c., (similar to that used for a blast furnace in the smelting of iron ore,) which would be more certain than fan blasts for forcing a strong air current through the workings, down either a bare shaft, or piped or boxed for conveying the strong air currents if such shaft need be used for drawing or pumping purposes, but would recommend an independent down-cast shaft for the purpose, and then such shaft could have a wide tower, say five yards inside, and sufficient height, clear of impediments, and a large moving cowl at the summit, open to windward, for the free ingress of strong winds as an auxiliary, which would relieve the engine for repairs, &c. The top of the down-cast shaft to be provided with a large trap-door, capable of being opened during strong winds; and the coals and men's time now consumed at the furnace below to produce imperfect ventilation, could be applied to the working of the blast engine at the surface, and would cause the workings to be conducted with safety and good light. By having sufficient fresh air sent down and split and divided by artificial means, under the supervision of the mining engineer, it would admit of gas works at the surface to supply the underground workings with street lamps, as there would be no danger of explosions, through the gassy or foul air, being sufficiently diluted and expelled up the up-cast shaft; by using a blast cylinder of sufficient size to an independent down-cast shaft, it would answer all the necessary purposes without an underground furnace or exhaust fan blasts. The blast cylinder can have either a spiral screw or piston.

A New Copper-Rock Pulverizer.

A Michigan exchange notices a new machine called "Mabbs' Pulverizer," that is "certain to crush from seventy-five to one hundred tons per day," and which, at a recent trial, "put through a measured ton of rock in six minutes, or at the rate of two hundred and forty tons in twenty-four hours." It is thus described: The pulverizing is done by four immense wheels traveling in a circular trough, thirty feet in circumference, and seven inches bed between rims. The wheels are four in number, each six feet in diameter, sixteen inches thick in the centre, with six inches breadth of face, weighing, with its half of the axle, about seven and a quarter tons. These wheels make ten revolutions per minute, and, consequently, travel three hundred feet in that time. The wheels are driven by a gear wheel on a vertical shaft passing down through the centres of the two axles which cross each other at right angles. The rock and water is taken from a hopper built around the upper part of the driving shaft, and conveyed in iron pipes (receiving from opposite sides of the hopper) under one wheel. After each of the first three wheels there follows a steel-toothed rake, which stirs up the rock after being crushed down by the preceding wheel, and placing the particles in different positions before the next wheel. Following the fourth wheel is a plough which throws the sand and water out over the side of the trough into a launder through which it passes to the separators and washers. At the outset the rock has been crushed into as fine sand as is ordinarily done, by stamps, but the copper contained is not broken as fine by the machine, as all the particles are simply flattened out and not pounded into fragments. The flattened pieces are entirely freed of adhering rock, while their bulk is preserved, thus saving a large quantity of very fine copper and greatly decreasing the quantity of slime copper.

Some Facts About the Resources of Missouri.

Iron Mountain, Pilot Knob, Bogy and Shepherd mountains are among the greatest natural curiosities in the world; they are 1,500 feet above tide-water, and 1,000 feet above the Mississippi river, and east of the geographical centre of this continent. These mountains, or masses of iron, are the astonishment and admiration of geologists and iron men, and are the richest class of specular ores. There is besides a number of other iron hills of less magnitude, yet quite large enough for any one of them to supply the whole valley of the Mississippi with iron. These mountains, hills and mines would yield 1,000,000 tons of wrought iron for four hundred years. The depth of the lead bearing rocks and extent of surface are greater in this State than in any other portion of the globe. The same may be said of copper and iron ores. On the north and west of this great iron centre are found lead, copper and zinc; on the south and east, copper, silver, argentiferous lead, nickel, cobalt, platina and gold. Near to these mines are the villages of Iron Mountain, Pilot Knob, Middlebrook, Ironton and Ar-

cadia, all of them thriving towns. Coal, to supply the demand of large foundries, can be sent by the railroad from the mines and points already named.

The Igniting Point of Petroleum.*

Crude petroleum generally gives off, at common temperatures, quite enough vapor to form an explosive mixture with the air if it be in a confined space, as in a partially empty lamp, bottle, or cask. For this, among other reasons, crude petroleum is always refined before it is sold to the general public; it is distilled, and the portion which first rises into vapor is collected apart, and, under the name of petroleum spirit, is used as a substitute for turpentine. The next and larger portion which distills is the refined petroleum, so extensively sold under various names as a cheap illuminating oil. The residue is heavy oil used for lubricating purposes. As petroleum is not a definite chemical compound, but a varying mixture of several hydrocarbons, as, in short, it has no constant chemical or physical property of which advantage might be taken in devising a ready method of taking igniting points, it follows that the method selected must be more or less arbitrary, empirical, conventional. The only feasible plan would seem to be, to select a direct method, simple in principle, easy of execution, occupying little time in performance, and inexpensive; and when this is found, to take steps for accomplishing a far more difficult task—namely, securing its universal adoption. Now the ignition method is sufficiently simple in principle: but I would advise the rejection of its application in an open dish, saucer, basin, or bowl. Even if this experiment could be always similarly performed under constant conditions, which is impossible, the rapidity with which vapor escapes from the surface of the liquid renders a thermometric reading, taken during the experiment, an unfair indication of the temperature at which inflammable vapor would be given off from the petroleum in a lamp or other closed or partially closed vessel. Again, the petroleum must not be heated in a common bottle, on account of the great liability of the latter to fracture; nor is it necessary to use a ve sel contrived for violently agitating the oil and air together. But if the bottle be substituted by a short wide tube of glass, thin, so that it can be heated with safety—by, in short, a rather wide variety of the common test tube of our analytical laboratories—then, if equal quantities of petroleum be operated on, the liquid be fairly well stirred and shaken, and the test flame be always introduced to the same distance from the surface of the liquid, constant results may be expected. The same tube may be used in which to insert a hydrometer to take the specific gravity of the oil, and thus, with a naked thermometer somewhat longer than the test tube to act as a stirring rod, we have a compact and inexpensive apparatus. Half way up the test tube should be a mark indicating the amount of petroleum to be operated on. The test flame should be introduced to within half an inch of the surface of the oil. Into the test tube of thin glass six or six and a-half inches long and one and one-eighth inches in diameter, pour the liquid until the tube is half full. Stir the liquid well with a naked thermometer, having the usual degrees marked on the stem, shaking also so as to keep the upper part of the tube well wetted with the liquid, and note the temperature. Now introduce the flame (of a thin split of wood, or, far better, a small gas flame a quarter of an eighthth of an inch long) into the mouth of the tube to within half an inch of the surface of the liquid, quickly withdrawing it, and noticing whether a thin blue flame runs between the test flame and the surface of the oil. If not, warm the tube by passing the bottom of it gently through a spirit lamp or other flame, or by dipping the lower portion of the tube into hot water, constantly stirring the liquid with the thermometer, frequently noting the temperature, and introducing the test flame every minute or so. The temperature at which the thin blue flame appears will be the igniting point of the petroleum, the point at which it gives off inflammable vapor. To correct this result, let the tube gradually cool, introducing the test flame as before. The lowest temperature at which the vapor takes fire is the true igniting point.

*Abstract from *London Mechanical Magazine* of paper by John Attfield, Ph. D., F. C. S.

Mine Explosions—A New Remedy.

The French journal *Cosmos* suggests a very simple expedient for removing the dangerous gas from mines, which is nothing more or less than that of burning it! As this gas burns quietly in the open air, and requires mixture with air in certain proportions, to become explosive, it seems probable enough that if the mine were at all times brilliantly illuminated in every part with burning lights, the gas, when gradually evolved, would be consumed in detail, and not suffered to accumulate until it reached the explosive proportion. But as this expedient would evidently present no remedy, but rather certain disaster, in case of the sudden liberation of a large volume of gas from a concealed reservoir, it is only worth mentioning as an interesting paradox—fighting fire with fire.—*Scientific Amer.*

Original Papers.

[PREPARED FOR THE JOURNAL OF MINING]

A NEW CHEMICAL NOMENCLATURE,

By SAMUEL DYER TILLMAN, A. M., Professor of Technology at the American Institute of the City of New York.

[No. III.—Continued from Page 23]

As a whole, the old symbols, representing combining proportions, are applicable to neither column of atomic weights. Fewer changes are required by adopting the weights of the first column; yet the advantages derived from estimating H = 1 are so obvious, that the symbols used in the remainder of this paper will represent the numbers in the second column. Those having the old value will be denoted by the usual letters, and symbols of doubled value by full-faced type.

A complete series of known oxides of several metals (excluding hydrates) are here presented, for the purpose of comparing the old and new system as to brevity and precision.

1. Protoxide of iron (Ferrous oxide),	FeO :	Ferramat.
Sesquioxide or Peroxide iron (Ferric oxide),	Fe_2O_3 :	Ferremit.
INTERMEDIATE OXIDES.		
Black or Magnetic oxide of iron (Ferroso-ferric oxide),	Fe_3O_4 :	Ferrimot.
A nameless oxide of iron (auct. Berthier & Glasson.)	$4\,FeO\,Fe_2O_3 = Fe_8O_7$:	Ferreameet.
Scale oxide of iron (inner layer),	$6\,Fe\,O\,Fe_2O_3 = Fe_3O_9$:	Ferreimeot.
The name of the latter, expressing the supposed rational formula, is Ferreameat—Ferremit.		
2. Protoxide of manganese (Manganous oxide),	MnO :	Manamat.
Red oxide of manganese (Manganoso-manganic oxide),	Mn_3O_4 :	Manimot.
Sesquioxide of manganese (Manganic oxide,	Mn_2O_3 :	Manemit.
Peroxide of manganese (Dioxide of M.),	MnO_2 :	Manamet.
3. The Chromium atom, properly Chromam, may be contracted to Chram; which is especially convenient in denoting chromates.		
Protoxide of chromium (Chromous oxide),	CrO :	Chramat.
Magnetic oxide of chrome (Chromoso-chromic oxide),	Cr_3O_4 :	Chrimot.
Sesquioxide of chromium (Chromic oxide),	Cr_2O_3 :	Chremit.
Monochromate of sesquioxide of chromium,	Cr_3O_6 :	Chrimeat.
Bichromate of sesquioxide of chromium,	Cr_4O_9 :	Chromeot.
Neutral Chromate of sesquioxide of chromium,	Cr_5O_{12} :	Chrumoit.
Acid chromate of sesquioxide of chromium.	Cr_6O_{15} :	Chreamyut.
Chromic acid,	CrO_3 :	Chramit.

Including hydrates, the oxides of metals, metalloids and organic radicals now known may be estimated in round numbers at 400. The following oxides of a halogen are adduced to show the inadequacy of the old nomenclature in defining the higher combining ratios of only two elements:

Iodic anhydride, I_2O_5, evut; Hypoidic acid, I_2O_4, evot; Intermediate oxide (auct. Kæmmerer), I_6O_{13}, eavyit; Subhypoidic acid (auct. Millon), $I_{10}O_{19}$, euvyeot.

A few brief observations will, perhaps, aid in apprehending the purport of numerous new combinations, illustrating the doctrine of types and substitutions.

1. An atom has a definite maximum power of holding other atoms in chemical union. The normal quantivalence or highest saturating capacity of an atom, that is, its so-called atomicity, decreases as it is duplicated and condensed.

2. *Chlorad* is ranked in the class of elements having the lowest saturating power: therefore *ad* may be taken as the unit of measurement, and thus words already in use in this connection are made peculiarly appropriate; for example, ***hydral*** is a nomad, ***oxat*** is a dyad, ***nitran*** is a triad (often a pentad), ***carbar*** is a tetrad, ***phosap*** is a pentad, and often a triad. ***Carber, ferrem, alem, chromem,*** and other DOUBLE-ATOMS forming sesquioxides, behave like hexads, while *manam* appears to be a heptad. ***Arsam, bisam, and stibam*** are either triads or pentads.

3. A molecule is a complete chemical structure, capable of existing in a separate state: that part of it which can unite with the various monad radicals—known as the residue or remainder of a molecule—being regarded as a broken structure, or imperfect body, may be called a *torso*.

4. The atomicity of a torso, or of a radical containing one atom of an element united to one or more atoms of another element, is equal to the difference between the normal saturating power of its components. The following are examples:

Compound monads: Ammonium, H4N''' = olan or ilanal'; Hydroxyl, H'O'' = alt'; Amidogen, H_2N''' = elan'; Nitric oxide, N'''O2 = anet'; Cyanogen, CivN''t = arb'.

Compound dyads: Carbonyl (Carbonic oxide), $C_{iv}O''$ = arat or art''; Monamine, HN''' = alan''; Methylene, CivH = arel or ach''.

Compound triads: Formene, CivH = arl'''; Phosphil, PvO'' = apt'''.

5. The researches of Kekule have shown that the same number of carbon and hydrogen atoms, having different saturating powers, are related to different hydrocarbon series; and the equivalence of such isomers may be determined by the number of hydrogen atoms they contain. For example, glyceryl, C^3H^5 (*echarl'''*) having three less hydrogen atoms than the hydride of propyl (*ichel*) C^3H^8, is a triad; while allyl, C^3H^5 (*arechal'*) having one atom of hydrogen less than propylene, C^2H^6 (*irlil''*), is a monad. Thus also to the series of highest saturation of carbon belongs acetylene, C^2H^2 (*erel* or *erliv*); and, having four atoms of hydrogen less than the hydride of ethyl, C^2H^6 (*echel*), it is a tetrad. If two atoms of the monad bromine be added, the saturating power of the compound will be diminished two degrees; therefore the bibromide of acetylene, $C^2H^2Br^2$ (*erleb*), is a dyad. The late brilliant elucidations of atomicity by Wurtz, have thrown light on many points, to which reference cannot now be made.

6. A complex hydrocarbon monad radical may be regarded as the combination of a monad with an even number of radicals or torsoes *in equilibrio*. The following are examples:

Acetyl = (CO''CH^2'') + H = artachal'.
Propyl = (CH^2'' CH^2'') + CH^3' = ichal'.
Butyl = (CH^2'' CH^2'' CH^2'' CH^2'') + H = ochal'.

7. Gerhardt classified chemical compounds under four types, two of which, the hydrogen and the hydrochloric-acid types, are molecules consisting of two monads: one molecule should therefore be taken as the primal type, and the other as a subtype. The use of only three types would, at first sight, be commended for its simplicity; yet, the vast diversity of Nature's combinations involves the necessity of many multiples, and the formation of mixed types, as proposed by Odling, in which the saturating power of the several parts is distinguished by the signs used in this paper. Valid arguments may be urged in favor of using at least five types, in each of which, one-half the saturating power expended to form the molecule is derived from a single atom. The atom-holding power of one half being balanced by that of the other half of each molecule, it is proposed to distinguish each type by the name expressing the equivalence of one half of it. The following will show the value of the new characters in typical expressions:

MONAD TYPE.	DYAD TYPE.	TRIAD TYPE.	TETRAD TYPE.	PENTAD TYPE.
Hydrochloric acid.	Water.	Ammonia.	Marsh gas.	Chloride of phosph'r's
al }ad.	al }at. al }	al } al }an. al }	al } al } al } al }	al } al } al } al } ap. al }

In representing the most important bodies formed by the replacement of one or more atoms of hydrogen by one or more monad radicals, the change consists, as will presently be shown, simply in substituting for *al* the name of a radical ending with ***al***. The different views of chemists respecting the typical form of the same body may be distinctly illustrated by the new characters; take, for example, acetic acid, $C^4H^4O^4 = C^2H^4O^2$. Kolbe's carbonic-acid type, being essentially the same as the water type, is omitted, and the so-called radical type is added in the following table:

EMPIRICAL.	GERHARDT.	DEBUS.	FRANKLAND & DUPPA.
olert or echet	al } artachal } at.	achal' ar- at'' alt'.	ar- al al al at'' ar alt'.

The empirical name *echet* is the second in a series

of which *achet* (formic acid) is the first; *ichet* (propylic acid), the third; *ochet* (butylic acid), the fourth; *uchet* (amylic acid), the fifth; and so on to the highest or most condensed molecule *weuchet* (melissic acid), represented in the old notation by HO C^{60}. $H^{59}O^{3}$, and in the new by $C^{30}H^{60}O^{2}$. These short and simple names, formed by changes in the first syllable, represent these acids as the result of successive additions of *ach* ($\cup H^{2}$); but they cannot be made available in illustrating the changes which occur when an atom of hydrogen is replaced by a metal or a radical. The other empirical name may be used by those who prefer to express no opinion as to the actual constitution of the acid. To carry out this view, the replaceable atom of hydrogen in the acid may form the first syllable, and the remaining syllables will be the terminal of the acetates formed by monad metals, e. g. acetic acid, *alilert;* acetate of potash, *Kalmilert*. The terminal syllable must be doubled in value, to denote acetates of dyad metals; for example, acetate of lead, *Plubmealort*. In consideration of the existence of numerous important bodies, into the construction of which an acid-forming radical of this series enters, it has been found most derirable to designate the acids by names which bring the radical more clearly to view. Preference is therefore given to those which are readily resolved into the water or dyad type; thus, acetic acid, as *alartachalt* or *lartachalt*, is easily separated into syllables which reveal its typical structure [*al-artachal*]*ot*. When *al* is replaced by a monad metal, the typical form is still apparent [*am-artachal*]*at*. An atom of a dyad metal replaces the hydrogen atom in two molecules of acid; therefore the torso *artachalt* is doubled, which is indicated by the suffix *e*, having the sound of *eh* thus, *artachalte*. In the sesquiacetates, the double-torso *artachalte* is trebled, and indicated by the suffix *ea* = 6; for example, the acetate of alumina = $Al^{2}C^{12}H^{18}O^{12}$, is *Alem-artachaltea*.*

* The final vowel or diphthong, as an exponent, may yet play an important part in illustrating the principle of polymerism, and the complex and varying composition of mineral salts containing many atoms of different bases.

(TO BE CONTINUED.)

[WRITTEN FOR THE JOURNAL OF MINING.]

UNDERGROUND TRANSPORTATION.

By ALFRED P. ROCKWELL, Professor of Mining in Sheffield Scientific School of Yale College.

The subject of underground transportation has attracted more of popular attention since the project of an underground city railway for New York has been under discussion, but it is a subject always of interest to the miner. The aim is to move the mineral in the cheapest manner. If the quantity is small, and the distance short, a man pushes the loaded car out and the empty one back. If a horse or mule can be used, and have full work, he will move it cheaper than men can. But the case to which I wish to call attention now is, where the mineral, such as iron ore or coal, is bulky, and large quantities of it are to be moved, often for considerable distances. Economy and rapidity of transportation from the interior of the mine to the shaft, or to the surface, may determine the question of profit. The question is, can any power be economically substituted for horses or mules? The answer is, yes; steam has been. The locomotive is, from the nature of the case, out of the question. The power must then be stationary, and the engine placed at one end of the road, the end near the shaft. We are familiar enough with inclined planes at and below the surface, where the stationary engine hauls the load up the slope, and also with self-acting inclines, on which the loaded cars coming down draw up the empty ones. But the use of the stationary engine, with horizontal roads, is very rare in the mines in this country. The "*engine-planes*" are, however, quite common, in the best English collieries, and, more recently, have been tried with success in Germany.

The whole subject was examined by Nicholas Wood, the grear colliery viewer of Newcastle, England, and the results published in detail in the transactions of the North of England Institute of Mining Engineers for 1854. I propose to give some of his principal conclusions, together with those recently arrived at in Prussia.

It is, perhaps, not generally known how much less effectively a horse works in the confined passages of a mine than upon the surface. Mr. Wood found, by careful experiment, that "the general useful performance of a horse underground is not more than *one-third* the ordinary, or *one-fourth* the maximum useful performance on surface railways."

Add to this fact the labor and expense of maintaining the stable of horses underground, and of keeping it clean, well ventilated and in order, and there is reason enough for seeking some more economical application of power.

In what circumstances, then, will it be advisable to substitute steam for horses? Mr. Wood says, "when *three* horses are required to do any amount of underground conveyance, it is high time to consider whether a steam engine ought not to be employed; but certainly, when *five* horses are required, there ought to be no hesitation as to the propriety of substituting engine for horse power."

The arrangement of these engine-planes is perfectly simple. The engine is placed so that its waste steam escapes into the upcast shaft. The boilers may be also underground, or the steam be brought in pipes from the surface, as may be most convenient. The pipes must be of good size, six or eight inches in diameter, so that the friction from the passage of the steam may not be too great, and be well packed with some non-conducting substance, to prevent condensation.

The track should be of T rail, and may be either double the entire distance, or single, with a turnout, where the loaded and empty trains pass. Such a road will last longer, and need fewer repairs than if horses were constantly cutting it up.

The round wire rope, two to three inches in circumference, according to the load, has been uniformly adopted. It runs on wheels twelve to eighteen inches in diameter, placed midway between the rails, at intervals of twenty feet, where the road is straight, and at intervals of five feet or less, on sharp curves. It winds up on drums about ten feet in diameter. The wagons in use in the north of England collieries weigh about 460 lbs., and carry 900 to 1000 lbs. each. The train is generally thirty or forty of these wagons. In one instance (Seaton Delaval colliery) it was 106.

The length of the planes varied from a few hundred yards up to two miles. None at that time exceeded the latter length.

The speed attained for part of the distance was about fifteen miles an hour. At Seaton Delaval the train of 106 wagons, with a gross load of 64½ tons, or upwards of forty-one tons of coal, was drawn at an average speed of nine miles an hour on a plane 2046 yards long.

The main road may have one or more branches, each provided with its separate ropes, which, by a simple arrangement, can be attached to the main rope at the junction of the branch with the main road. The engine can, however, draw but from one point at any one time.

The cost of transportation was, under the most favorable conditions, about three cents per ton per mile; but more frequently was from five to six cents per mile. The economy of moving such quantities such distances by steam rather than by horse power, is too evident to need further demonstration.

Such results, striking as they seem, are not uncommon in the north of England where I have frequently noticed them in examining the mines.

Mr. Wood gave special attention to the subject of the friction of these small wagons, and found that "with wheels twelve inches in diameter, and axles one and a half inches in diameter, the friction over ordinary underground roads is 1-82 part of the weight, but that with well constructed roads, wheels and wagons, it may be reduced to 1-100." He found, further, in investigating the inclination of different planes, that self-acting planes must have an inclination of one in thirty; that ordinary inclined planes, say 2000 yards long, must dip one in twenty-eight in order that the train of empty wagons may descend by their own weight and drag the rope after them. That for drainage a dip of one in 200 was required. That roads nearly level, worked by horses, must have a dip of one in 130 toward the shaft or outlet in order to produce the maximum effect.

As an instance of the comparative economy of steam and horses when the amount transported was far less than in the above mentioned cases, I notice the report of Mr. Bailey, of a mine in S. Staffordshire, where formerly sixteen horses were required to haul ninety tons of coal a day to the shaft, some of it up a slope, at a cost of twenty-five cents per ton for the distance hauled. Subsequently a stationary engine was used, which, with three horses, hauled 180 to 200 tons per day, at a cost of six cents per ton for the same distance.

Quite recently, the same system of horizontal engine planes has been introduced into the mines near Saarbrücken, in Prussia, and an account of the working of them is given in the Prussian *Zeitschrift für dos Berg. Hütten. und Salineuwesen*, for 1865.

In one mine the plane was 2280 yards long, laid with a single track, with turnout. The track of T rail cost $5.200. The road had many curves, some of them very sharp, one with a radius of forty-two feet. These curves form no serious obstacle. An engine of twenty-eight horse power hauled a train of forty or fifty cars, at a speed of three to four miles an hour. The amount transported in 1864 was about 170,000 tons, at an average cost of about five cents per ton per mile. There was a saving of forty-five per cent. in the use of steam over horse power.

In another case 300 tons a day were transported at a cost of six cents per ton per mile. Had horse power been employed for the same work the cost would have been nine cents per ton per mile. There was a further saving of nearly three cents per ton in the repair of roads.

In still another case, the length of the plane was 160 yards. On this an eight-horse power stationary engine hauled a train of eighteen wagons (nine tons), at a speed of one and a half miles an hour. The total amount transported daily was 500 tons, at a cost of eleven cents per ton per mile. The same work was formerly done by four horses at a cost of fourteen cents. Here is a saving of twenty per cent., and the roads maintained at much less expense.

This is a subject of greater importance where the shafts are deep and costly, and when it is desirable to work large areas, say of 1000 to 3000 acres, from one outlet; but even in our shallow mines, there are many places where steam may be economically substituted for horses. Cheap fuel is a great element of prosperity. This is secured by reducing the cost of production.

☞ During a recent survey of Mount Diablo, California, the chief of the party discovered some very rare specimens of fossil sun fish, sea urchins, star fish, and other beautiful petrifactions. He says that these fossils are in great abundance, and can be procured from the highest point of range dividing Bear creek from the Legante, about five miles from the San Jose crossing. The fossils are apparently crystallized or imbedded in a lime cement, and are arranged in elegant patterns of rare beauty, like the meridian lines of an artificial globe. The whole mountain, for miles in extent, is one mass of conglomerate formed in fossils of marine animals and plants, showing that at some period the ocean had its banks or beds along and over this ridge, 3,000 feet above its level.

Mining Summary.

GOLD AND SILVER.

Nevada.

The Comstock.—The Virginia *Trespass* gives the following review for the week ending March 16th: During the past week the mining market has been very active, and the very favorable weather of the past ten days has tended to increase the transactions; yet since last week we hear but few changes to report, and those principally in leading stocks. In this county the roads have been manifestly improved, ore has been forwarded for reduction, and the usual amount has been taken from the lower levels. Within the next month we may reasonably expect a large exportation of bullion, as the mills will all be running at full capacity within three days. The roads, which have caused a cessation of labor, are again getting passable; each mine on the Comstock has its dump full of ore; increased activity is being displayed in its transportation; the demand for coin must be met with shipments of bullion; and, all in all, the general tone of mining matters look in excellent condition..... Savage opened at $1,920 bid, advanced to $1,950, steadily declined to $1,865, and to-day will doubtless sell at a lower figure. The mine presents no particular change in its appearance, and the usual quantity of ore is being raised of as good quality as heretofore; but the Thornburg suit now pending before the U. S. District Court, Judge Baldwin presiding, at Carson; the large preparations made by defendants to meet pleas by an importation of old Comstock experts, together with previous rulings of the Court, tend to cause the decline, which we feel assured will continue until a much lower figure is reached, and yet, perhaps, not materially injure the prosperity of this, one of the best mines on the lode.....Chollar-Potosi has been considerably dealt in during the week. Sales at the commencement, $252, with a slight increase until yesterday, when it closed at $250, buyer 30. The ore at the Blue Wing station continues to look well, and the developments of the mine are all favorable. In one or two weeks we hope to be able to report good ore at the new shaft, as prospecting at that point is being vigorously prosecuted.....Imperial opened at $198 and advanced to $220, closing at $218, ex-dividend of $15 for February. The general appearance of the mine is much the same. The new shaft is now down 825 feet, timbered, with but little water; but within the last week the rock at the bottom has grown harder, and somewhat impedes the work of sinking..... Gould & Curry has remained at the figures quoted last week, $175, and no new developments are reported.....Yellow Jacket opened at $775, advanced to $865, and closed yesterday at $825, buyer 30. In the south mine the ore is good. The company's mill at Empire has remained idle during the month, unable to obtain ore for crushing. In the winze at the north mine the work of prospecting has been vigorously prosecuted, and it is to be hoped that new developments of a favorable character will be made. .....Crown Point opened at $890, advanced to $899, increased to $925, and declined to $850, closing sales. The contractors for running the drift to open the fifth level are working vigorously. Much of the future welfare of the mine depends upon developments from this level, and the ore which it is confidently expected will be cut in the winze being sunk.....Empire has been steady at $482.....Ophir opened with sales at $226, advanced to $231, and closed at $237. The drifts from the two lower stations are being pushed north and east in hard porphyry. No new developments so report.....Belcher sold at $117; nothing new to report .....Bullion opened at $14, steadily advanced to $23 bid. We have rumors of new developments, but know nothing definite.....Confidence advanced to $36..... Sierra Nevada has sold at from $5 to $5, and the work of putting in the pump column is steadily progressing..... Brokers are buying legal tenders at 73c., and selling at 75c..... County scrip, second class, is worth about 30 cents in coin.....City scrip is selling at about 15 cents. ..... The *Enterprise*, March 8th, says: Work on the New Empire, Imperial shaft, is rapidly progressing towards completion. It has now attained a depth of 825 feet. It is intended to sink the shaft 75 feet deeper —making its total depth 900 feet—when a drift will be run from its bottom to the east wall of the ledge, which is believed to be about 100 feet distant. Of late the rock has much increased in hardness, making the work much more difficult and expensive; however, this will be counterbalanced by the fact that the timbers in that part of the shaft passing through the hard rock will be less liable to be injured by moisture and the swelling of the walls, than in parts where it is cut through clay or soft rock. Notwithstanding the great depth of the shaft there is at present but little water to raise. As soon as the shaft has reached the depth intended and a drift has been run to the east wall, machinery will be erected and the new shaft will be used for raising rock and the old hoisting works abandoned. We hope these companies may find their lead a solid mass of sulphurets bound together with wire silver and riveted with gold.....During the past two weeks Theall & Co. have assayed bullion to the amount of $84,516 95; Rubling & Co. to the value of $82,000, and Kuh, $5,608 75; a total of $172,025 70. This bullion, about three tons, still remains in this city, and is but a very small portion of that now awaiting transportation to California. There are wagon loads of bars at all the banks, and over sixty sacks at Wells, Fargo & Co.'s .....From our file of *Trespass'* to March 13th, we take the following items: The Overman is only running, its pump at the hoisting works, wood being unattainable at this time. In a few days regular work will be resumed. Owners in this mine feel sanguine of cutting a rich lode at the lower levels .....Timbers are being put in the Cole company's tunnel, where so large an amount of ground was washed out by the rush of water. When it is secured the ledge will be prospected; and from some pieces of ore washed to the mouth of the tunnel, we believe the ledge will prove rich in precious metals. The flow of water has not abated in the least since the first grand rush, but holds steady—the water flowing being a body of about three hundred inches.....In both the old and the new shafts of the Yellow Yacket mine vigorous work has been lately done in sinking for the lower level. When the new works were first started, sinking in the old shaft—which was then 600 feet deep—was abandoned, and the upper levels worked for ore; but since the terrible condition of the roads has precluded the possibility of keeping the dumps clear of ore, both the old and the new shafts have been sunk deeper—the old shaft to a depth of 675 feet, and when 25 feet additional shall have been attained, a new station will be opened and the ledge drifted for. In the new shaft the depth was 500 feet, and it has been sunk to a depth of 585 feet, requiring only fifteen feet additional depth to open a new station at that point. Meanwhile, two drifts are being cut for prospecting at the third level, and some very good ore has been cut. When the lowest levels of the mine are well opened we shall look for a large increase of ore from the Yellow Jacket.....On the 3d instant, a miner named John Brown was killed in the old Potosi shaft of the Chollar-Potosi mine.

Humboldt.—The *Register* (Unionville) March 9th, gives the following summary concerning the location of the Humboldt mines, of the various mining districts, and their relative position to the Pacific Railroad: Humboldt county embraces a large area, extending from the 39th deg. 45 min. north latitude, to the 42d deg., and from the 38th deg. of longitude, west from Washington city, to 42d deg. 10 min. The line of the Pacific railroad enters the southwest corner of the county, near the Lower Crossing or Big Bend of the Truckee river. It bears thence northeasterly to Humboldt Lake, leaving the Desert Mining District five miles to the eastward. From the lake it follows the Humboldt river to its source. At a distance of 40 miles from this lake, it strikes the town of Oreana; and at 45 miles, Etna. From Etna, the Arabia mines lie four miles westward; and the mines of Sacramento District lie eight miles to the west. At or near Etna, the line of railroad crosses to the east side of the river, and continues in a northerly direction to a point between St. Mary's, on the north, and Humboldt City, on the south—equi-distant about four miles, leaving Echo, El Dorado and Humboldt mining districts on the right, from six to eight miles. From this point, it bears northeasterly, via Mill City, to Frenchburg, leaving Prince Royal, Santa Clara and Buena Vista mining districts to the right—five, eight, twelve and twenty miles respectively. It leaves the Sierra district from six to eight miles to the east; while Eugene and Winnemucca lie north—the one five and the other two miles. From Frenchburg it bears easterly to Gravelly Ford, passing four miles north of Gold Run district. At or near Gravelly Ford, the line of railroad enters into Lander county, after having passed through Humboldt county for a distance of 250 miles. There are other prominent mining districts at a distance, which are not named above, among which are Pine Forest and Black Rock, about 80 miles northwest from Unionville; Table Mountain, Silver Hill, Bolivia and Salina, from thirty to forty miles south, in all of which are valuable mines. The Great American Basin, formerly looked upon as the Sahara of the Western Hemisphere, as a vast sand desert and alkali plain and destitute of water and animal and vegetable life, containing hundreds of thousands of square miles, is bounded on the east by the Sierra Madra or Rocky Mountains, and on the west by the Sierra Nevadas, with their immense forests of timber, lofty peaks of perpetual snow, beautiful mountain lakes, and majestic rivers that flow in sublime grandeur, cutting the mountain sides for hundreds of feet in depth, till the overhanging masses of rock seem to meet in the dizzy height above. It is destined to become the centre of busy life, of industry, energy and wealth, with its teeming millions. Already villages, towns and cities are springing up all over the land; while the ceaseless clatter and shrill whistle of the quartz mills are met by the deep intonations of the miner's blasts from our mountain depths, mingling with the enlivening notes of the hammer, the anvil and the pick, making melody with their elements of discord. The primeval masses of immense parallel mountain ranges traverse this basin from north to south. It is here, in these ranges, under the frowning and lofty peaks of the Humboldt mountains, where the geological formation and the laws that govern the mineral world all point—as being among the grandest depositories of precious metals on the globe; which offer to open their rock-bound bosoms, and pour in upon the lap of the energetic and industrious miner their immense treasures, which have been heaved up from the sombre depths of yawning chasms by the internal fires of the globe, and which for centuries have been lying in dormancy awaiting the advancing columns of civilization.....From the same paper we take the following relative to the Montana mine: A specimen from this great mine, weighing one hundred and ten pounds, and forwarded to the Paris Exposition by Geo. F. Geisse, will attract the attention of the scientific gentlemen in attendance. We doubt if this specimen will have an equal in the great Fair. The Montana is undoubtedly one of the greatest mines in Nevada, and it is a shame that the several companies on this vein are so slow in its development. We are assured, however, that the Rochester company will resume work as soon as they can erect pumping and hoisting works. We are glad to learn this fact, for we know of no finer showing than the Montana presents. There are other mines in the immediate vicinity which we doubt not will prove to be of immense value when opened, among which are the Sacramento company's property, the Bullion, Lodi and Vancouver. That well known and thorough business man, Geo. Werterberg, has taken the property of the Sacramento company in hand and has gone east to negotiate for the necessary funds for its development. The Nevada silver mining company, of New York city, has a fine property on the Montana vein, but, by the most unpardonable mismanagement, no showing has been made for the vast amount of money expended. Work has stopped on the mine and their fine mill stands idle, when the mine might and should have been thoroughly opened, and the mill kept running day and night, turning out its thousands of dollars weekly. Twenty thousand dollars judiciously expended will make this one of the finest properties in the county. Had we the property belonging to the Nevada silver mining company, in Humboldt, and twenty thousand dollars with which to commence operations, we would not thank Mr. Astor to die intestate, even if we were his only son.....John C. Fall shipped on Thursday, by Wells, Fargo & Co., 322 ounces of bullion valued at $400. This is the second shipment within a few days from the justly celebrated Golconda mine in Gold Run district. John M. White, one of the owners of the mine, informs us that they have between four and five hundred tons of ore out that will yield about $90 to the ton, but until they can get a mill of their own not much can be done in the way of reduction. We are pleased to learn that negotiations are now in progress for the erection of a twenty-stamp mill at an early day.....We learn, by a private note from Mr. Lovelock, that the new mining district near Humboldt Lake contains some of the finest mines in the county, from all appearances on the surface.....We are glad to learn that our friend Judge L. M. Carter, has struck it rich on the first south extension of the Golconda ledge.....Yesterday we went through the Elmira silver bullion company's works on the North Star mine, and were highly pleased with the flattering prospects of this company. Dr. Looms, the superintendent, deserves great credit for the energy with which he is driving the work.....Concerning the Orena furnaces, the *Register*, March 2d, says: The furnaces consist of two large and several small smelting furnaces, one large and one small calcining furnace, one large and one small cupeling furnace. When these furnaces are worked in their full capacity, they are capable of smelting and refining about twenty tons of ore each twenty-four hours. The ore first passes through the smelting furnaces, and when the contents are drawn off, yields about six hundred pounds of metal to the ton of ore smelted. It is run into bricks of about the ordinary size, and is then passed on to the calcining furnaces, where the antimony, sulphur and arsenic are expelled by a slow, steady fire, continuing for several days. When the metal is drawn from these furnaces, there remains only lead and silver. These metals are also run into bricks, not quite so large as when first melted. So soon as the railroad is completed to this point, the metal will be shipped in this form to some point in California or in Europe, where facilities for separating can be more readily obtained. From the calcining furnaces the bricks are passed to the cupel furnaces, where the process of refining is completed. In these furnaces the lead and silver are separated, the lead being drawn off in the form of litharge, the silver remaining in the cupel. The litharge is worth about $60 per ton in its present state, but as that sum would not defray the cost of transportation to California, it is of course practically valueless at present. The product of a ton of ore after passing through the three different processes of smelting, is found to be about $100 in silver.....Calcining and cupeling are done with sagebrush, greasewood and small mountain cedar, obtained in the vicinity; but smelting requires large quantities of charcoal, which is obtained from the Pinenut mountains, about 30 miles to the eastward. The company have now under contract a large amount, some 250,000 bushels, to be delivered during the coming spring and summer. The cost of coal delivered at the furnaces is about fifty cents per bushel.....$300,000 in coin has been expended in

the purchase of the Montezuma mine and in the erection of their present reduction works; and to the energy and skill of Mr. Mason, and those who so generously aided him, are we indebted for the dawning of a new era in the prosperity of Humboldt county..... The Montezuma mine, belonging to this company, promises exhaustless supplies of ore for these furnaces.....We find in the Virginia *Enterprise*, March 12th, the following additional relative to Humboldt mines: J. M. White is having fine returns from workings of rocks from the Golconda ledge, in Gold Run district. Different mills work it from it $16 to $100 the ton. The Monroe Series is paying well—all the rock that the company gets is worked. Elzy is east, and is in a fair way to succeed in getting a large working capital to properly open the mine and build a mill for the reduction of the rock. The Agamemnon, near Unionville, finds a good, well-defined ledge in the lower level, though the quartz shops no great deal of metal. The prospects in other portions of the ledge, however, have been so good as to preclude the possibility of the work proving unprofitable. The new diggings lately discovered near the border of Humboldt Lake are of an ore closely resembling the Montezuma—argentiferous galena. Thos. Pease is having a perfect success in his Winnemucca mines. At seventy-five feet he has a fine four-foot ledge of excellent ore in the Union Series. He is superintending work for a New York company, and expects soon to go to the east to report, and return with the means to erect machinery—for crushing or smelting, as may be deemed advisable.

Silver Bend.—Belmont correspondence of the *Enterprise*, dated February 23d, runs thus: Owing to the severe cold, prospecting has been almost entirely suspended, and the snow has covered both mountain and valley, holding alike the rich croppings and the barren bowlder from the eye of the prospector. Nothing is being done except the legitimate mining carried on by a few of our large companies. That there is a vast amount of mineral wealth distributed through this region, I have no doubt, and when the railroad is completed to the Humboldt, so that by it we can get supplies cheaper and quicker than we can now, then will the great developments take place. But we must have cheaper supplies and more capital to enable us even to commence this great work. I do not mean to say that there are no ledges, or even a few, that will pay now. There are many ledges now known that will not pay for working at present rates; but, when everything becomes cheaper, they will be worked with profit. For instance, rock that will yield $50 per ton, unless in very large quantities, will not pay now for working, whereas, if it only cost $20 per ton to mine and work it, it would yield a handsome profit. The interest manifested in our mines by Eastern capitalists is doing much to aid us in our efforts, and I can say that, whenever their affairs have been conducted by men of experience, their investments have either been remunerative or soon will be. There is a great belt of mineral-bearing country running through the eastern part of this State, stretching from the Humboldt to the Colorado, which, ere many years, will be the home of a great and industrious population—making it then, in population and wealth, as it is now geographically, the centre of the State. And it is not too much to predict that the time will come when a traveller starting at the Humboldt may journey to the Colorado without scarcely being out of the sound of the stamps; and then this belt will be the great silver and copper-producing region of the world, rivaling in richness and extent the once famous mines of New Spain in their palmiest days .....The *Reveille*, March 18th, says: The discovery of the Transylvania ledges in the district of Silver Bend may be regarded as an interesting epoch in the history of mining in that section of the State generally characterized as the Reese river region. Prior to that, the most important discovery of mineral deposits in the southern portion of the State occurred at Silver Peak, and later at Hot creek, in the southeast. Several of the mines of Silver Peak were included in the property of the Great Salt Basin Company, the principal of which were the Vanderbilt, Pecatello and Sisson. A ten stamp mill for wet crushing was erected by the company, which continued in operation for several months, but with what degree of success we have never learned. The mill was closed nearly a year ago, during which time the property was made the basis for the organization of a grand company, which, it is understood, will commence operations, on an extensive plan, early this advancing season. Very little has been accomplished at Hot creek since its discovery, beyond the location of a great number of claims, not many of which have been thoroughly opened and tested. Outside of the district of Reese river, that of Silver Bend has attracted the largest measure of attention. The most important location in the district—Transylvania Nos. 1, 2 and 3, and the El Dorado—were made on the 2d of May, 1866. The Transylvanias are believed to be one massive ledge, and No. 2 is generally known as the Highbridge; and the belief that they are identical is strengthened by increased development. Besides, the uniformity of the ore obtained from the different locations on the respective Transylvanias would seem to remove all doubt. Fortunately, perhaps, for Silver Bend, an innate love of adventure and a restless energy impelled David E. Buel to visit the section in the month of May last year. Prompted by a happy intuition and his go-ahead spirit, he purchased mining property almost without any other examination than a view of its splendid croppings. He selected a handsome situation, and laid out the town of Belmont, which includes the site of his mill. He took immediate and active measures for the erection of a mill, and before the close of the following September it was completed and reducing ore from his Highbridge. The mill has ten stamps, and crushes the ore wet, the result of which, at first, was not very successful. The average yield of the ore did not exceed fifty per cent., but the latter and present workings obtained as high as sixty-five, and perhaps seventy per cent. of the silver. The erection and working of the mill, and the opening of the mines, were beset with great difficulties, but in spite of these the project of Colonel Buel has been very successful. Up to the middle of the present month there had been extracted from the Highbridge 1,000 tons of ore, which were reduced at the mill at Belmont, and yielded the handsome sum of $100,000. The whole of this ore was procured from the depths of eighty feet. The Transylvania No. 1 has been opened to the depth of twenty-five feet, and fifteen tons of its ore have been worked, with a yield of $300 per ton. The Combination Company has opened its location on the Transylvania No. 2, or Highbridge, by tunnel and shaft, in which there are grand developments of mineral, and we learn that an agent is now in San Francisco forwarding the machinery for a forty stamp mill, which is to be erected with dispatch. The Silver Bend Company—known as the Child and Canfield location on the Transylvania—has developed its ledge thoroughly through two inclines, which are about 600 feet apart, and which are now being connected by levels. A splendid specimen of the mineral from the mine of this company, weighing 644 pounds, the bright and varying hues of which rival the plumage of the peacock, was presented to the cabinet of the Exposition .....Correspondence of the *Enterprise*, mentioning this company, says they have 70 tons of rock out of the first shaft, which, it is believed, will yield about $200 per ton, and over 200 tons, the product of the second shaft, that will yield $115..... A letter, published in the *Trespass*, March 16th, gives the following additional particulars concerning Belmont: I would advise those who come to bring plenty of money with them. There are about 300 people here now. About fifty of them are at work. There is one fine ledge here—the Highbridge. It has been traced nearly half a-mile, and a shaft has been sunk in it to the depth of 100 feet. The ledge ranges from three to seven feet in width, and good ore is found all the way down in the shaft. Two mills will go up this summer. Our town of Belmont contains about fifty buildings of all descriptions, and twenty of them are whiskey shops.

Reese River.—We made, says the *Reveille*, March 16, a brief visit this morning to the reduction works of the Manhattan Company. The company is working at present the ore from its North Star mine, which is of a high grade. The large lots worked during the month of February and up to the middle of the present month averaged $240 per ton. Within the past few days a much better class of ore has been developed towards the end of the western level of the mine, from which an increased yield is anticipated. At the expiration of the current month the agent of the company will make a heavy shipment of bullion to New York, where the numerous bars of solid silver will be so many eloquent verifications to the stockholders of the good management of the property. We were informed that the mill would continue to reduce the ores taken from the mines of the company until the month of April, when custom work would be resumed for a time. Our attention was called to a good lot of choice chloride ore, obtained from a mine in Yankee Blade, which will yield largely of silver. While going through the mill we were impressed by the skill which had been manifested in overcoming the defects of the original bad arrangement of uniting the parts of an old and a new mill. Everything has been reduced to a good and economical system.

Reveille.—J. S. French, just from Reveille (March 16), reports the Rutland mill completed, except the placing of the pans, which were on the road, about five days' travel, from the district when he left. Had it not been for their delay, the mill would have been crushing ore at present. Matters were quite lively in the district, and a considerable amount of work was being done on different claims.....The Highbridge ledge has recently had considerable work done on it, and at about twelve feet from the surface smooth, polished casings, almost of the color of mahogany, have been developed, which the owners regard as strong evidence of its being a true fissure vein. The stratum of ore is about four feet wide, and is of quite as high a grade as the croppings. Recent developments also on the Scorpion ledge justify the conclusion that it will prove of great value. Mr. Rigby, of San Antonio, is an owner in the Scorpion, and after having worked several tons of the ore he has decided on putting up a mill in the district. The recent discovery of a large ledge in the canyon near the northern boundary of the district is attracting much attention. It is outside of the limestone, and apparently on the dividing line between the porphyry and slate, lying west of the belt. It is estimated that the ore will work without assorting about $120 per ton, and the width of the vein is from eight to ten feet. The Rutland mill is nearly ready to go into operation, and as the Reveille Company are taking out ore to be worked at it, there is not much risk of the mill having to remain idle for the want of rock. The mill will be a substantial five stamp affair, but will have no furnaces at present. It is still a very doubtful point, however, whether the ore of the district can be effectually treated without roasting, but experiment will determine that.

Colorado.

The *News* reviews the "situation" thus: From the large amount of snow that has recently fallen, it is fair to infer that spring will open earlier than usual this year. Already the advance of the returning miners who have wintered in the States, has reached our city, and within the month active preparations for the summer's campaign will be made. More placer or gulch diggings will be worked this year than there has been since 1860. This will be effected because of the cheapened cost of living, enabling miners to make fair profits by working ground from which expenses could not be realized under such rates as $30 per hundred for flour, with other necessaries of life at proportionate prices. At those gulch mines whose source of supply is the rich farming region of the Arkansas valley, this cheapening of supplies will be most marked and beneficial. We are informed that flour can already be contracted to be delivered in the South Park at seven dollars per hundred the coming summer. Other supplies being in the same ratio of cheapness, we may reasonably expect, and we think, confidently predict a greater yield of gulch gold the present season than Colorado has known for several years. We do not anticipate that much prospecting for new lodes will be prosecuted this season, as most of the companies who are already organized have abundance of property that requires development to prove its value, and but few new companies are being formed. Development of lodes discovered within the past two years will be carried on with vigor, should the spring trade open finely, and the present stringency of the money market relax a little. In Georgetown, James creek, Snake river, Peru, and Red Mountain districts, this work of development will be carried on extensively, should everything prove favorable. Each of the districts we have named will receive mills, machinery or furnaces this year, if we are correctly informed..... We are indebted to the same paper for the following items: Boulder county is looking up. Her new mining districts now in the course of development are filling the citizens with hope. Ward, James and St. Vrain's districts will contain a great number of miners the coming season.....An experienced miner informs us that he has discovered beds of fire-clay in Denver and vicinity.....The *Transcript* has an interesting contribution concerning the Silver mines of Colorado. The writer thinks (as we do) that no country has better prospects ahead for the successful working of silver lodes. He places Snake river first for size of lodes, Argentine second and Georgetown third. In this latter district the crevices are very narrow, but the ore is so rich that ten cents per pound has been offered by parties to have it brought to the surface. All we require is smelting furnaces .....Ed. Berthoud draws attention to the extensive deposits of peat in the mountain valleys, and believes they will become in demand as fuel.....The Alameda Gold and Silver mining company are reported to have obtained one ounce of silver from six ounces of Colorado ore. The stuff was manipulated at St. Joe..... Mr. Stofer, who has just arrived from James creek, says the Denver *Gazette*, March 21st, informs us that the snow is quite deep in the vicinity of the new mining district, which has had a tendency to retard active operations for some days. Matters there will soon assume a tangible and business shape. Mr. Gray has his small test furnace completed, and has made one run in it which was entirely satisfactory. Patten, Beebe & Dixon's 12 stamp mill was on its way in, and would be put up as soon as possible. Prospects are bright for lively times in the early Spring..... We hear of a number of men who propose to work the bar-diggings along the Clear creek at the mouth of the cañon as soon as the weather will permit; the se mines have heretofore paid fair wages, and now that living is somewhat reduced in price we see no reason why these diggings should not be remunerative, if judiciously worked. The *Register* is informed that preparations were being made to work during the summer on the bars of Clear creek, from Spanish Bar down below Idaho. One company has a capital of $65,000, and will work Montgomery Bar. There will be in all, about ten or twelve companies in operation. .....Opal correspondence of the Denver *Gazette*, March 18th, says: The Pewabic, south of Russell gulch, one of the discoveries of '64, is giving out its ore at the rate of a cord a day, though but little is being reduced, not because it requires the treatment of a new process to extract the gold, but because the owners are awaiting a reduction in the price of crushing which at present is too high. The yield of this lode per cord last winter was from 18 to 22 ounces in stamp-mills. There are between thirty and forty

cords piled up, which amounts to quite a sum at the above rates. The Leavenworth lode, which, in early days, cancelled all others in its returns, after four years of idleness, is being put in shape. This vein has been drifted out 1,700 feet for its surface quartz, which was exceedingly rich, but the moment the iron was reached a general suspension took place, and in the fall of '63 the most valuable portions of the vein passed into the hands of speculators, who have permitted it to remain idle, expecting to form a company of some millions on it, but failing, have concluded to work. North of this, say a distance of 300 yards, is another vein of extraordinary strength, the Calhoun —named after the illustrious champion of State Rights —which yielded its thousands before the more stubborn quality of rock was reached.

Washington.

A private letter in the *Statesman*, addressed to Dr. Shell, and dated Fort Shepherd, January 9, furnishes the following items: We have new diggings on a tributary of the Keotani River, within forty-seven miles of this place. About thirty claims have been recorded on Forty-nine Creek, but the stream has not been thoroughly tested. The discoverers took out forty-five dollars while prospecting. Another stream a little below Forty-nine prospects well, and so I think we may expect a small mining camp up there somewhere.

Arizona.

Late advices state that there is a considerable degree of activity in mining in Arizona. A new twenty-stamp mill, near the town of Wickenburg, is said to be running regularly with splendid results. The old five-stamp mill close by is also running, and is reported to be coining money.

Canada.

The Madoc *Mercury*, of recent date, says: On Monday a few pieces of gold were found in a claim owned by the North Hastings Mining Company (of this village), which is now being worked on the property of James O'Hara, Sr. The miner at work there found the "show" in a crevice which was discovered in consequence of a second blast being put in, in a place where a previous one had exploded downwards and laterally instead of upwards. From the dirt thus brought to light a few specks of gold were washed out. These specimens present a very promising appearance when placed under the microscope. This is the first discovery of gold, with any claim to authenticity, which has been made so near the village, Mr. O'Hara's farm being little more than a mile distant. We are informed by Mr. Dingman (on whose farm we some weeks since reported that "digging" was going on) that there is not the slightest foundation for the statement published in some of the papers that he has found gold. The weather has been very unpropitious for gold-hunters for the last few days. At the end of last, and the beginning of this week, the cold was as great as it was, on the average, in what is generally called the depths of winter; now a rapid thaw has set in, rendering locomotion very uncomfortable. At the "Desperado Mine," Upper Eldorado, we learn that some very pretty samples of copper have been found this week, as well as a specimen of some other mineral, which is supposed by some to be silver. They say that, at any rate, it is not galena .....The Kingston *News*, March 29th says: Some of the sand from the Richardson mine, contained in two small bottles, has been purified by Mr. Spangenberg, of this city, and the result is a beautiful button of fine gold..... Correspondence of the Montreal *Gazette* states: The long closed Richardson mine is about to be opened again and worked forthwith, Mr. Lombard, of Chicago, having paid over the sum of $15,800 to Messrs. Richardson and Howell, and deposited the balance of the purchase money for their interest in the mine. A receiver in Chancery is in the meantime appointed, until the suit with the other claimants to the property is decided, which, it is expected, will be in October next .....Mr. J. B. Fox, of Huntington, exhibited this week in the village a small nugget of gold which has been obtained from his claim on lot 16 in the sixth concession of Madoc .....An agent of the Madoc Gold mining company of Toronto, was here one day last week, and stated that the company would soon have one hundred men at work on their claims, which are in the vicinity of the Richardson mine..... The American miners who are working on Mr. MacLeod's farm, whose operations were noticed in my last, have at last been amply rewarded. They have struck a very rich lead, running seemingly to the north-west, from a specimen of which I have seen a small quantity of gold taken, perhaps three grains to the pound of quartz. A party from Kingston have offered Mr. Henry Cook the sum of $10,000 cash for his farm, and "ran all risks;" but from some specimens shown me, which I was assured came from his land, he did right in refusing it, as I am confident it will prove equal in richness to the Richardson mine; and I am credibly informed that some gentlemen from Peterborough acknowledged that they had taken from this mine, in a few washings, $500; and a Mr. Sanderson, an old Californian, informed me that he made a personal examination, and in one shovelful taken from beneath a ledge on the margin of the creek, he found one lump of gold as large as a small bean, and several smaller pieces. They seem to me to be of the monometric system, differing from any specimens yet found. This discovery is certainly genuine. New discoveries are reported every day, and some most dazzling stories are told, but I will reserve all notice of these rumors until satisfied of their truth. The Lake Copper Mining Company, Messrs. Thomson, Dean and Wallbridge, have met with an unexpected run of good luck in finding gold in some worthless quartz which they had thrown away in their search for copper. The quartz, a fine specimen of the "cap" lock, and the gold were shown me to-day by Mr. Thomson, the agent of the Commercial Bank. Two more four-horse stages have been put on the route between Picton and Madoc by Gov. Blanchard, of the former place, and the various stage lines brought over seventy passengers to this place to-day, and a number came on foot. Another four-horse stage has been placed on the route between Belleville and Bridgewater by a company from the city of Philadelphia.

Nova Scotia.

From the annual report of the Chief Commissioner of Mines, dated December 1, 1866, we learn that the gold mines continue to be worked steadily and satisfactorily. The quartz lodes being worked show no decrease in richness, and improvements in machinery, and increased skill in mining and extracting the gold, has led to the profitable working of many lodes, which in former years were abandoned or untouched as too unprofitable to be mined, and that any falling off that may be noticed in the products of the various districts was due more to the stopping work in consequence of transferring property than any other cause. Operations at the Oven's Areas have been resumed, and it is believed favorable results will be forthcoming. Here several shafts, ranging in depth from thirty to sixty feet, have been sunk on a lode five inches thick. One of these, two hundred and forty feet from the sea shore, is fifty feet deep. A tunnel is being excavated to the bottom of this shaft from the shore, and is now one hundred and forty feet in length. At Renfrew, under new management, the mines are in a prosperous condition. New and larger quartz crushers have been erected, and mining is carried on with greater vigor, and with a success which promises to be lasting. As a proof of this, in 1865 the yield of gold was 820oz. 12dwt. 23gr., in the year just closed it has amounted to 4176oz. 3dwt. 17gr., or more than five times what it was or the preceding year. On No. 1 North lode, worked by the Ophir company, four shafts have been sunk, the depths of which are from eighty to one hundred and seven feet. Four shafts have been sunk on No. 2, or the South lode, which is ten feet thick. The North lode is also worked by the New York and Renfrew company, who have four shafts on it. On the "free claim" this company is working seven lodes, varying in thickness from two to eighteen feet. On the mines worked by Allen & McLure there are four shafts. The thickness of the lode is ten inches. At Oldham there exists a depression, and the product for 1866 shows a falling off in comparison with that of the preceding year, yet the average yield per ton of quartz and the average yield per man engaged in mining are greater. Better results in every particular are anticipated for the ensuing year. The Boston and Oldham company have sunk four shafts on a lode four and a half inches thick. From No. 2 shaft, which is seventy feet deep, the lode has been stoped to the west within thirty feet of the surface. In Mr. Lockhart's claim the lode is five inches thick. The product of Waverley for the year was less than for 1865, yet this district still shows the highest aggregate product of any in the province, and more than double that of any other. Notwithstanding all drawbacks the prospects continue very cheering. The "barrel quartz" beds of Laidlaw's Hill, abandoned three years ago, are being worked. The mines worked during the year are those belonging to Burdner & Co., De Wolf & Co., the Lake Major, the Waverley, the Boston and Nova Scotia, and the Hartford companies. The most important works are on the "Tudor Lode." Burdner & Co. have sunk a shaft two hundred and twenty-six feet. Nine shafts on the Lake Major company's claim vary in depth from 198 to 251 feet. De Wolf & Co. have sunk seven shafts, the deepest being 160 feet. The Brodie lode, the Jugger lode, and the Taylor lode are extensively worked. South of the Taylor lode, the Boston and Nova Scotia company have four shafts on No. 6 lode. At Montague, under new management, mining has been recommenced with much vigor. The Albion company have mined a lode, four inches thick, by open trenches, a distance of 500 feet, the greatest depth being 115 feet. The Union company have worked 381 feet to an average depth of 45 feet. At Tangier operations are being carried on upon a large scale and with energy. The mines have yielded some of the largest nuggets and richest specimens of auriferous quartz that Nova Scotia has yet produced. Notwithstanding the product was less, the yield of gold per man was greater last year than any previous. The "Jugger" and the "Leary" are worked by Barlow & Co. On the latter shafts have been sunk varying in depth from 40 to 120 feet. The "Jugger" is 320 feet to the north of the "Leary," and is twelve to fifteen inches thick. In Sherbrooke the result of the year's operations was most gratifying. The yield of gold far exceeds that of any previous year, and as a proof of the profitable character of mining in this district, the yield of gold to each man, according to official returns, was $1,382 86. New lodes are being opened, and the general prospect is promising. Messrs. Cumminger have sunk three shafts. The east is 87, the middle 122, and the west 200 feet. The New York and Sherbrooke company have sunk a shaft 73 feet. Wine Harbor produced less last year, in consequence of the comparatively small number of men engaged in mining during the year. The yield per man was greater. The "Lattie lode" has been extensively mined. The shafts vary in depth from 70 to 183 feet. In Wagamatkook new lessees have commenced operations, with good prospects. The two American companies that leased the most valuable portion of the district, have abandoned it altogether. Ground of a promising character has been turned up at Lawrencetown, and good results are looked for. In some of the as yet unproclaimed gold districts operations are quite active. On the old Truro road, near Gay's river, and upon Gay's and Corbet's farms, mining was commenced in 1863, in a curious bed of auriferous conglomerate, unlike anything found elsewhere in the province. One company has erected a neat and substantial stamping mill, which, at the close of the fiscal year, was nearly completed. That the conglomerate bed at this place contains a large proportion of gold is beyond all question. Early in the year a prospecting party made a discovery of some auriferous quartz lodes in the forest, in the township of Uniacke, Hantz county. Already one quartz mills has been erected, and the quartz lodes opened are numerous, of workable thickness, and rich in gold.

The following table shows the total receipts and expenditures of the Nova Scotian gold mines for the year ending September 30th, 1866:

	Receipts.	Expenditures.
Oldham	$1,050 98	$217 17
Renfrew	3,411 29	529 11
Waverley	5,854 78	2,779 24
Tangier	275 71	1,386 51
Stormont, Isaacs' Harbor	$10 50	400 29
Wine Harbor	987 38	267 14
Sherbrooke	2,902 41	466 67
Owens	1,039 97	14 00
Montague	684 22	124 05
Wagamatcook	410 00	166 00
Lawrencetown	226 02	18 00
Unproclaimed	1,025 93	212 50
Prospecting Houses	566 49	.....
Total	$18,201 99	$6,611 38

COPPER.

Michigan.

The Ontanagon *Miner*, March 30th, gives the following relative to mines in its district: Flint Steel River Mine has three shafts sunk to the second level under the deep adit, 200 to 270 feet from surface. The western shafts—Nos. 1 and 2—were sunk on the most southern one of three veins intersected by the exploring cross-cut level driven under the old Minnesota management, while No. 3, east, is sunk on a more southerly lode, and one the dip of which is much nearer a horizontal than the others. The lode at this point has a well defined foot-wall of coarse spotted trap, quite regular and essentially different from the vein, hence forming an excellent guide in sinking and drifting. The lode in the other shafts being much more vertical, they are now all on the same base line at the bottom and will be easily kept there, but the country north seems broken up and disturbed, though containing some splendid copper-bearing lodes, one of which can be wrought from the present east shaft. Where these different lodes unite in sinking, immense deposits of heavy copper will be found, and the usual width of the south lode, ten to twenty feet, will be found largely increased. This was the case at No. 2 shaft over the second level, where an immense deposit of heavy copper—fifty to sixty tons in masses—was removed in 1865-6, the opening from which is one of the largest in the district, requiring the removal of over four hundred cubic fathoms of ground. In drifting east from this point on the first level under the deep adit, a strong lode bearing north of the true course was followed, while the drift west from No. 3 followed the true southern wall on which the shaft was sunk. Capt. Wills became aware of the error in engineering, but whenever he attempted to bear south from the drift east, found himself in the country and consequently without any vein. When the ground was spent which should have connected them, about five hundred and fifty feet, a re-survey showed that they were ninety-seven feet apart, and a cross-cut of that length now connects the two levels. The drifts are all right for future use, as they both are paying lodes and must of necessity be made so in their development, but the cross-cut could have been dispensed with by a careful and accurate survey and mine plan having been made and followed out. The massive point east of No. 2, already referred to, is of course an exception, as that was at the junction of two veins, but there are slopes over the same level east and west of No 1, and also east of No. 3 shaft, and where there is no evidence of more than one lode, and the width is from twenty to thirty feet and rich in stamps and barrel work. There are poor spots in the mine, but they constitute the exception and not the rule, as any one will see who will look carefully through the openings. The third level drifts, east and west, from No. 3 shaft, are

just started and show a splendid lode of heavy barrel and stamps mineral, in pieces of two to five hundred pounds in a chunk. The same level extends sixty feet east and seventy west of No. 2 shaft, much of which is through a similar lode. No. 1 shaft has just reached the same level, showing heavy barrel work at many places in sinking. No stopping has been done over this bottom level and less than half the available ground has been removed over the upper levels as far as opened, leaving an excellent chance for the production of copper rock, in any required quantity: but there can be no advantage in adding to the already large accumulation of this class of mineral till the means of reducing one hundred to one hundred and fifty tons per day to sand are also at hand .....Caledonia—No. 4 cross-cut under the road, intersecting with the north vein, last Saturday exposed a rich lode. The second level, east from the crossing on the Knowlton vein, is nearing the main cross-course on that part of the Range; the vein is ten to twelve feet wide and rich in lump and stamps mineral. The rising winze to connect Nos. 1 and 2 cross-cuts on the Champion shows a richer lode the last ten feet than had been previously found. The winze sinking west of Butler shaft on the same lode continues in a very rich lode. From these facts it will be seen that nearly all the north side openings have improved in product since our last report .....Rockland—The breaks at the stamp-mill were mended and work recommenced on Tuesday of last week. The old vein continues to yield about its usual results, from the few places still being mined thereon. The first level on the south lode was connected between shafts last Monday. This opens a block of vein two hundred and fifty feet long by one hundred feet high for summer stoping, and also affords ventilation for continuing the level east and west all summer, if desired.

QUICKSILVER.

Oregon.

Correspondence states that the cinnabar mines discovered about one year since by Reynolds & Co., lie about 25 miles west of Canyon City. The ore, the proprietors state, has been recently assayed in San Francisco and yielded in quicksilver 60 per cent., and gold at the rate of $85 per ton. The yield of quicksilver alone is reported to be superior to that of the celebrated New Almaden of California .. ..We are assured, says the correspondent, by those interested that active operations will be had on the mine on the opening of Spring.

California, Spain, &c.

The following, taken from the last annual report of the Quicksilver Mining Co., will interest many of our readers. It appears that under the direction of the officers of the company, Mr. C. E. Hawley, formerly Chief Engineer at the New Almaden mines, made, during the past year, personal examination of the principal quicksilver mines of the world; the Almaden of Spain, the Idra of Austria, and the Huancavelica of Peru. The results of his investigations as here condensed, the directors believe, will afford an opportunity to form a correct opinion upon the relative merits of the various mines. The report says: The Santa Barbara mine of Huancavelica, Peru, which has produced quicksilver to the value of more than eighty millions of dollars, is now in a dilapidated condition, and almost entirely abandoned. Its remote location from the seaboard, the low grade of its ores, the absence of fuel, and the character of the mine population of that district, all combine to prevent this mine from producing quicksilver at a profit in competition with the other mines of the world. The Idra mine in Austria, belonging to the State, is worked with skill, economy, and a moderate degree of success. Its monthly production is from 600 to 800 flasks, and under ordinary circumstances, the ores being of a low grade, the production cannot be materially increased. This mine had a surplus of about 14,000 flasks, which has recently been sold and the mine leased by the Government for a period of ten years. The Almaden of Spain, the great rival of the California mine, is the most serious competitor to the Quicksilver Mining Company in the production of quicksilver. Mr. Hawley reports this mine to be in a flourishing condition, with rich reserves of ore on hand, and lacking only in vigor of administration to enable it largely to increase its production. The Spanish Government have recently contracted with Messrs. Rothschild for the delivery of 50,000 flasks of quicksilver from their stock on hand in Seville and in London, which is reported at 68,000 flasks, and this quicksilver is now being sent to the different markets of the world for sale at a reduced price. The quicksilver mines of California, other than those owned by this company, have made a moderate production during the year, amounting in the aggregate to 10,759 flasks. It is understood that Mr. Barron, who receives the product of the New Almaden mines, also controls the remaining production of California. The total production of the quicksilver mines of the world, during the year 1866, is as follows:

	Flasks.
New Almaden, California	35,150
Almaden, Spain	22,400
Idra, Austria	7,225
New Idra, California	6,045
Lake Mine, "	2,980
Guadaloupe, "	1,654
Mount Diablo, "	80
Total	85,534

The accumulated stock in the different markets of the world is, as near as can be ascertained, about 120,000 flasks, and this abundant supply, with the annual production undiminished, has caused a serious reduction in the price. The capacity of all the quicksilver mines now in active operation for producing quicksilver, is at least double the annual consumption, and while quicksilver is an article of absolute necessity for those purposes for which it is mainly used, yet neither excess of supply nor the recent reduction in price, appear materially to increase the demand.

COAL AND OIL.

Virginia.

Richmond, Va. papers, April 6th, contain the following relative to the late terrible colliery explosion at the Clover Hill pits, in Chesterfield, by which deplorable accident sixty-nine persons lost their lives. At a meeting of the Board of Directors of the Clover Hill company, Mr. James H. Cox submitted the following report: I was formerly the superintendent and general agent of the Clover Hill Railroad company, and President of the Clover Hill Coal Mining company, and had for many years charge of all the mines at Clover Hill. Last January I resigned my position, and Samuel R. Owens, who had been my chief mining engineer for about twenty years, was appointed in my place. During the time of my service there had been several small explosions at some of the mines, at all of which I have been present, except on one occasion. On Wednesday last, the 3d inst., at half-past 2 P. M., I was in my house, distant about three-quarters of a mile from the pit called "Bright Hope," when one of my servants ran in and said that he apprehended that an explosion had taken place at the pit, as he had hear l a loud report and saw smoke arising from the pit. I immediately left my house and was satisfied of the reality of the report. I at once repaired to the pit. When I reached it I found the managers, with such of the laborers as were out of the pit, preparing to make a descent. Some delay was experienced in completing the arrangements to make the descent, so that the men did not reach the bottom of the pit until about five o'clock. On their return they reported that there was a fire in a small closet or lumber house about forty feet from the shaft bottom. They saw no man, living or dead, and did not believe there was a living man in the pit. I urged them to return and make a further and fuller examination, with a view of seeing if a single individual might not be saved. I was satisfied there was no danger of a second explosion at that time from the fire at the place where they reported it to be. I appealed to them, and offered them a large reward to descend again, but they declined to go, on the ground that there might be fire in the rise workings, in which case there would be danger of another explosion. The advice of all the most experienced miners was at once to close the shafts hermetically, and by excluding atmospheric air to extinguish the fire. This course I resisted with the hope that I might prevail on parties to descend again. Early next morning I prevailed on three men to descend, who returned and reported that the fire was moderate in extent, but could not be extinguished with the men and means at our disposal. I was then satisfied that all the unfortunates in the pit were lost beyond hope, and the only thing left was to close the pit. I then gave my consent that this should be done. I believe that everything that could be done was done to save life, under the circumstances; but my belief now is (from partial examination of the pit since the explosion,) that every man in the pit was either instantly killed or survived but a few moments. I am well acquainted with the arrangements that have been in existence for ventilating the Bright Hope, and am satisfied they were so complete that, if faithfully executed, there would have been no explosion. The cause of the explosion will be a mystery, for all who might have revealed it are locked in the rigid embrace of death; but the supposition, and most probably the true one, is that it was caused by the gross negligence of the two deputy gas men, Thomas Marshall, Sr., and John Weale, the latter of whom paid for his negligence the penalty of death, he being killed by the explosion. For this pit there were three gas men - Mr. Thomas Marshall, senior, chief, and the two deputies above named. The duties of the chief, who is an old and experienced miner, seventy years of age, and was taught by Mr. Buttle, the celebrated English miner, is to oversee his deputies, whose duties are in the pit. They relieve one another, and whose turn soever it is on duty is required to go down into the pit at four o'clock in the morning, and visit every portion of it, and ascertain if there is any accumulation of gas anywhere. If there be no impure air the miners are notified, and they descend at seven o'clock and go to work. During the day one of the gas men has to be on the look-out for any impurity in the air, and, if such be found, is required to warn the workmen not to go near the place, and, if an explosion is to be apprehended, they must be made to leave the pit. Some time ago the miners had occasion to move an air door at No. 8 upset. [An upset is a portion of the pit which is worked on higher ground than the main level, and an air door is so constructed that by the closing or opening a draught can be thrown into or checked out of any coal chamber that may be desired.] The fact of the door having been removed had been reported to Mr. Marshall, senior, and he had ordered both deputies to have the door replaced, but both neglected to have it done. It is supposed the gas accumulated at the upset until the whole place became choked, and in all probability had backed down to the main level, and that one of the mule drivers had set fire to it with a lamp he was carrying. This explosion could have been prevented had either of the deputies attended to their duties, even on the morning of the disaster; but it appears they did not even visit the place, and, of course, did not know its condition. On the morning of the explosion young Marshall went down first, and he stated he did not visit there. At ten o'clock he was relieved by John Weale. Just previous to the explosion one of the workmen who came out of the pit asked Weale, as was the custom, "How's everything?" Weale, who was on his way to the shaft to get his dinner, after having pretended to go round, replied, "Everything's all right." The part of the pit where the explosion is supposed to have occurred is eight hundred and sixty feet below the surface of the earth, and about nine hundred feet from the mouth of the pit. The pit is about 3,500 feet long, At the time of the explosion the miners were at work in both the northern and southern portions of it. The report of the explosion is represented as being tremendous, and was heard ten and fifteen miles off. As soon as it was heard crowds flocked around, and there ensued a scene, made by those who had to mourn the loss of some brother, husband or friend, which cannot be described, but will never be forgotten. The force of the explosion was very great, and must have caused a great deal of damage to all portions of the mine. Both of the shafts were materially injured. As an instance of the force of it, the shoes, lamp and tin bucket of Mr. Hiram Magruder, who was nearly at the bottom of the pit, seven hundred feet below the earth, were blown upon the platform, some distance over the mouth of the pit. The body could not be found. The destitution caused by this calamity is very great, and our citizens should at once give some aid by which their immediate necessities might be relieved.

Oregon.

Recent correspondence of the San Francisco *Bulletin* states: That there will be found to be a large supply of coal in Oregon is beyond a doubt. The Coose Bay coal is not unknown in San Francisco, though its quality has not gained for it much of a reputation. Other deposits have been discovered on the coast further north, whether large or small I cannot say, nor whether resembling that of Coose Bay. But a mine is now being worked on the Cowlitz river, six or eight miles from its junction with the Columbia, which bids fair to supersede in merit any yet discovered on the Pacific coast. The structure and appearance of the Cowlitz coal are peculiar, and at first liable to mislead the judgment as to its quality. It has a glossy surface, is rather light in weight, is perfectly clean to handle, and makes no soot in burning, all of which makes it a pleasant fuel for grates and culinary purposes. It also lights very rapidly, burns freely in the open air, and is free from sulphur. It shows, or appears to show, a woody structure, yet it is hard coal, making an intense heat, and holding fire for many hours. When burnt it emits a clear, white flame, and leaves a white ash, without depositing strong substances, or *clinkers*. It is not anthracite nor bituminous, though nearly as hard as the first, and quite as inflammable as the latter. Some miners call it cannel; some say it resembles Scotch splinth; but, altogether, it is easier to say what it is not than what it is. The fossils found in connection with it have created some doubt as to its age, many of them seeming to belong to the tertiary period, while others evidently are palm leaves. No thorough geologist has so far visited the mine; yet I see no impropriety in supposing that even a geologist might discover something new. Some pieces which were sent to Prof. Blake, of your city, returned an analysis "50 per cent. gas, of good quality, burning with a clear bright flame. A light brilliant coke is left This agglutinates ('cakes') pretty well, and adds to its value as a fuel. The coke on burning gives a very light ash, apparently free from iron. It is suitable for fuel and for gas-making. Coals having this appearance and structure seldom leave a coke when their gas is extracted." This analysis was made on an inferior specimen, before the mine had been well opened. This mine lies about three-fourths of a mile from the Cowlitz river, and is entered so that every foot in the side of the mountain gives an increase in depth about equal. A road from the mouth of the mine to the river is very easy of construction, with a down grade all the way. From the river bank the coal will be conveyed in barges to some suitable depot on the Columbia. The same parties owning this mine own a controlling interest in another mine of similar character on the south side of the Columbia, within six miles of the town of St. Helena. The qual-

ity of the St. Helena coal is equally good with that of the Cowlitz, but, being some miles from the navigable waters, will be more expensive to work in the beginning. One thing which, however, gives additional value to the St. Helena coal, is its immediate proximity to extensive fields of iron ore.

Washington.

The Walla-Walla *Statesman*, Feb. 22d, says: Rumor has been busy during the week circulating a report that a coal vein had been discovered somewhere not far from this city. Charles Brookes is said to be the fortunate discoverer. Specimens of what appear to be the croppings of coal are exhibited in proof of the statement, and are a sufficient evidence of its truthfulness. A good coal mine in any part of the valley will certainly prove a "mine of wealth" to its owner.

Virginia.

A telegram, dated Richmond, April 4th, says: An explosion in the Clover Hill Coal Pits, Chesterfield county, occurred yesterday, and twenty-five whites and fifty colored miners were killed. The pits to-day are burning, but the shafts are closed to extinguish the fire, so the bodies cannot be recovered.....Later dispatches from the Clover Hill Coal Pits, in Chesterfield county, give no further particulars of the disaster, except that three explosions were heard after the first one. An attempt was made to descend the shaft, but the bursting out of flames prevented it. Nothing is known of what occurred in the pit. Thirty whites and thirty-nine blacks were at work in the mine at the time of the explosion.

New York.

BURLINGHAM, SULLIVAN COUNTY, N. Y., April 3, 1867.

EDITORS JOURNAL OF MINING—GENTLEMEN: Unquestionably the most important and useful of all minerals are coal and iron. The increasing demand for these minerals has of late attracted great attention on the part of those interested in mining and manufacturing, and in many instances very slight indications of the presence of coal or iron have been investigated with more or less success. It is therefore a remarkable fact that the section of Shawangunk—so near to large and enterprising cities—never before underwent a geological examination. The surface indications everywhere show the great mineral resources which lie dormant underneath, and waiting for investigation. A year ago I had occasion to visit this interesting region for the first time. Starting from Newburgh in a westerly direction, traversing a series of secondary limestone, about eight miles west of this place, the transition into the coal formation appeared. From this point coal sandstone, coal slate, shales and conglomerates, and all the attendants belonging to the coal formation, with beautiful animal and vegetable petrifactions, followed in regular order. Examining the geological condition of this region while crossing it some fifteen miles toward the Shawanyunk Mountains, I was satisfied that along the southeastern slope of the Shawangunk Mountains, a most valuable coal and oil region exists. I therefore desire to bring before the public a few facts concerning this region. The Shawanyunk Mountains traverse the counties of Ulster, Sullivan and Orange, in a southeasterly and northwesterly direction, and are connected with the Pennsylvania and Montgomery Mountains, forming a large, deep basin. Sam's Point, a huge and serrated mass of conglomerate—which probably once covered the whole of this mountain range, but which has now disappeared from the greater part of it, owing to decomposition and great aquatic revolutions, which have carried the *debris* to the foot of the mountain, forming there considerable hills of alluvial—is the highest elvation in the mountain range, being about five hundred feet above the eastern valley, and twelve hundred feet above tide water level. No development or explorations have been carried on as yet in that locality. From this point down toward the Shawangunk valley, the stratification is formed alternately of coal slate, sandstone, coal shales and conglomerates, in which series are contained the coal seams. The slopes of the mountain, down to a part of the valleys, are covered by deep alluvial deposits, and the creeks and rivulets which have formed in them extending at some points through the strata, forming deep ravines and narrow valleys, thus giving the country a hilly appearance. The ravines and creeks show everywhere, exposed, the strata belonging to the coal measures. The debris in and along the ravines contain numerous fragments of coal, shales, sandstone, with interesting petrifications, hematite and clay iron ores, and in fact all the minerals belonging to the coal formation. Along this mountain there are numerous "benches," which are abrupt falls in the surface, resembling stairs, on which are invariably found the coal seams. These benches afford great facilities for explorations for coal in West Virginia and other coal regions. Four distinct coal seams are indicated above the valley, and judging from the fragments found in the ravines and creeks, contain a seam anthracite coal. But the main bulk will be found in the valley, where the undulating character of the strata and surface indicate large basins of bituminous coal. That the coal must be of a bituminous character in the lower section is indicated by the spontaneous outpouring of gas and oil. This coal formation rests on and is confined on the northwest by secondary sandstone, inclining from 40-45° towards the northwest—the southeastern confines consist of secondary limestone. The main inclination of this whole coal region is from seven to ten degrees towards the southeast. My survey extended over a width of from twelve to fifteen miles, but the whole length exceeds one hundred and fifty miles, of which my survey extended only twenty miles.

PROSPECT FOR OIL.

Judging from the prevailing character of this section, the springs of petroleum and other strong indications along the mountains and in the valleys, the spontaneous outpourings of the hydrogen gas—which often ignites, probably by the presence of the atmosphere combined with the presence of coal, the striking analogy of the geological features and of the character of the minerals and strata to those of the coal and oil regions of West Virginia and Pennsylvania, every geologist must feel convinced that there is a large natural laboratory underneath this section of country. As before remarked, no explorations have heretofore been carried on in this section, consequently I was obliged to make my observations from those places at which nature had exposed the strata. I would remark that at some places years ago—at a time when the people of this section had hardly any idea of mineral coal—oil was accidentally struck in digging wells for water. As a natural consequence the water was found useless and the wells abandoned. One of the wells, a hole seventy feet deep, is still open, and emits a gaseous, bad-smelling water, such as comes from a coal seam. Since my geological survey of this district, several gentlemen from Pennsylvania and West Virginia, well acquainted with the coal and oil business, have examined it, in relation to the coal and petroleum, and they not only concur entirely with my views and expectations, but have given most encouraging reports. In consequence thereof large tracts of land have been leased and several companies formed, of which the Walker Valley Coal and Oil Company are in full operation. They have sunk pipes through alluvial for some forty feet from the surface, and I found the sand and water taken out by the sand pump was strongly impregnated with petroleum and gas. CHAS. A. DE BLESSIER.

SLATE.

Minnesota.

The Superior (Wis.) *Gazette* notices the introduction of Western roofing slate into the Western market thus: This season there will be put on the market the first roofing slate taken from any quarry west of the Alleghany Mountains. The discovery and working of the Minnesota slates must revolutionize the trade in this article: for, if the Western States can be supplied from Western quarries, at equally favorable prices, we surmise the Vermont and Pennsylvania quarries must find a market nearer home. There have been organized two companies, who will, during the present season, go vigorously to work getting out slate at their quarries on the St. Louis river, in Carlton county, Minnesota. Samples of the article have been presented to the trade, who pronounce it unsurpassed by any in the market; and by or before midsummer it is hoped shipments of a large quantity can be made to Chicago, Detroit and the other lake cities. The Lake Superior Slate Company is the title of the organization first effected, and is composed of gentlemen from Wabashaw, in the State of Minnesota. They have had a force on the ground about two months, and, we learn, have now all the buildings erected which will be necessary for this season's operations, and their quarry in readiness to employ a strong force. The roof of one of their houses is of slate from their own quarry, and is, they claim, the first slate roof ever laid in Minnesota. This, however, is an error in part, as the roof of the light-house on Minnesota Point is of Vermont slate; but the house built by this company is, without doubt, the first ever covered with Minnesota slate, and the first slate roof in the State other than a government building. The St. Louis River Slate Company is a home institution, composed of citizens of this town and neighborhood. They have a small force at work now erecting buildings and opening their quarry. This force will be increased the coming week, and the work steadily pushed forward, with a view to put the product of their quarry on the market at as early a day as possible. The Board of Directors of this company are I. W. Gates, Denis Dean, R. G. Coburn, E. H. Bly, and Washington Ashton. The officers are I. W. Gates, President; Denis Dean, Treasurer; Washington Ashton, Secretary. With a good road from the quarries to the navigable waters of the St. Louis, a large amount of slate could be shipped by both companies early in the season; consequently the only drawback to the export of the article it is in the power of our Minnesota neighbors to obviate, which, we trust, public policy and an endeavor to develop the resources of the region will prompt them to do.

IRON.

New Jersey.

New Jersey correspondence draws a very sad picture of the districts in which the strike of the iron miners has taken place. All business operations have been suspended, and the country deserted. The machinery of the mines was kept going to prevent them filling with water, and also to obviate the loss of time necessary to set them going again should the miners return to work immediately. The men "on strike" march about to the different mines and compel those in them to abandon work. The numbers and strength of those who have struck, and the unprotected state of the country, has generated a feeling of alarm. The Morris men have been the leaders of this movement, and have resorted to every means short of actual violence to promote the strike, and with considerable success. The daily wages of these men is $1 65, and $23 is paid monthly for board. The miners held a meeting the other day at Port Orum, at which 1,500 men were present. They adopted the following resolutions:

Resolved, That having struck for higher wages we pledge ourselves to hold out until we obtain our just demand.

Resolved, That as the prices of the common necessaries of life are far above our reach, we are unable to maintain ourselves and families.

Resolved, That we conduct ourselves as becoming Christians in every sense of the word, and as American citizens showing respect for and abiding with the law.

Resolved, That we form into a mining protective society, for the purpose of procuring enough wages to support and maintain our families.

MISCELLANEOUS.

Missouri.

South East Missouri is well represented by the Ironton *Enterprise*,—a spirited, pains-taking, and, in all, a well-conducted journal. Mentioning the natural advantages of its section, it remarks: These are almost useless as long as we lack energy and enterprise. Money is also a necessary article, but we can accomplish little with that article alone. The men of energy and enterprise can soon possess a competency here. Work is needed to develop and bring into market our wealth. Our forests must be cleared, our mountains dug down, and the rich deposits of ores passed through the furnace; houses must be built, and improvements of all kinds made. There is a great demand for labor, and it can be made to bring speedy fortunes. Old fogyism must be rooted out, and the energy and enterprise so much needed substituted. Then, and not until then, will we see Southeast Missouri improve as it should.....Ed. Milligan writes as follows concerning the mineral wealth of those counties stationed east and south of the Marimec river: The most northern lead fields are in township 41, range 5, east, extending southwardly one hundred and twenty miles. Such are their extent, that mines of that metal can be found in almost every township, or, if not yet found and opened, geological indications clearly point out their existence in large paying quantities. Copper ore of superior quality is found in Shannon, Madison, Wayne, Iron, Washington, and Jefferson counties. Platina in Madison, zinc in Washington, and cobalt and nickel at Maine La Motte. Gold-bearing quartz has been found in Madison, and it is believed it will be found in largely remunerative quantities in Shannon county. Tin is also known to exist there, and also in the northern part of Butler county. The largest, and, indeed, most profitable ore, is iron. Here is found iron ore of the purest and best kind, inexhaustible in quantity, so that there is enough to supply the demands of the whole world to the end of time, and covering such a vast extent of country that it is impossible to monopolize it. In addition to the great and varied deposits of all the useful metals, there are also most excellent quarries of marble and granite. The first demanding our notice is within the city limits; a pure, black marble, unsurpassed by any Italian, and fitted for chimney and mantel-pieces, is found just above low water-mark on the shore of the river, half way between the Arsenal and Carondelet. There are also large quarries of variegated marble in Iron county. Barytes, an article much used as a substitute for white lead, is found in large quantities, and of great purity, in Jefferson county.....In the southeast corner of township 35, range 1, east, there is a large deposit of kaolin, and there was for some years a pottery there. Here can be manufactured superior stoneware to meet the wants of the valley of the Mississippi. [The writer should here have stated the fact that the finest bed of kaolin to be found in the world is situated in the western part of this (Iron) county. A pottery was for years successfully carried on at this bank, and continued so until interrupted by the rebellion.—*Ed. Enterprise*]

Bottled Caloric.

"Never despair," says Professor Jeannet, of Bordeaux: "your coal fields may fail, but acetate of soda will at any rate prevent your noble race from perishing during that gloomy British winter." This substance affords, in fact, says the Professor, a means of "storing up the solar heat." Its peculiarity is, that while it crystallizes when exposed, in solution, to a very slight degree of cold, it will cool without crystallizing if placed in a closed vessel. Cooling thus, it retains the greater part of the caloric which it has absorbed while being melted; and this caloric is given off the moment the bottle is uncorked or the jar uncov-

ered. M. Jeannet has proved it. "One kilogramme of acetate, melted and then cooled down in a closed vessel to the freezing point of water, disengages, when crystallization is induced by uncorking, heat enough to melt 300 grammes of ice, or to raise 300 grammes of water from the freezing point to 70° centigr." Swift was not so very wild after all, then. Sunbeams from cucumbers would scarcely be stranger than solar heat from bottles duly placed " in a glass frame that the sun's rays may be concentrated upon them." Well may the *Union Medicale* call the path which M. Jeannet has struck out "a seemingly fantastic one." Still it clearly hopes for great results from the discovery, and seems to look forward to the time when there will be a brisk trade between England and the south of France in "bottled caloric," and when the Englishman, graduating his hospitality (as M. Kervigan tells us he does already in the matter of drinks) according to the quality of his guest, will, for an inferior, simply uncork a few bottles of the watery sunshine of his native island—treat an equal to the strong but coarse caloric of Bengal—but if he has a lord at his table, will send down to his "heat cellar" for some of the "meilleur cru" of the "cote rotie"—warm but full of bouquet. *Nous verrons.* Any how, it is kind of M. Jeannet to try to console us under such a visitation as that which Mr. Jevons predicts, in the possible loss of our coal fields.—*Pall Mall Gazette.*

Utilization of Copper Smoke.

For generations past efforts have been made to utilize or neutralize the smoke emitted from the various copper works of the kingdom, which is known to be so injurious to all vegetation around. In the neighborhood of Swansea, which is the principal seat of the copper trade, there are thousands of acres with hardly a blade of grass upon the ground, and in many instances the smelters have had to pay heavy damages for the injurious effects of the smoke on the adjoining properties—even trees many miles distant being affected. About twelve months ago, Mr. H. H. Vivian, M. P., adopted an invention at his works in order to see whether something could not be done to abate the nuisance, and, if possible, utilize the smoke as well. A considerable outlay was incurred in giving a thorough practical test to the invention, and at the meeting of the West Glamorgan Agricultural Society, Mr. Vivian announced that his efforts had been crowned with entire success. The smoke is condensed, and by judicious admixtures a very excellent superphosphate is produced, which is especially suitable for root crops. Mr. Vivian calculates that in a short time he will be able to produce sufficient manure for forty thousand acres of land. The success attained will no doubt induce other smelters to follow the example, and many thousand acres, which are now almost a barren waste, will then be made fertile ground—*Mechanical Magazine.*

Mining Apparatus Fifteen Hundred Years Old.

Interesting discoveries (observes the London *Review*) have recently been made in the San Domingo mines of Spain, showing the methods adopted by the ancients. In some of the mines the Romans dug draining galleries nearly three miles in length, but in others the water was raised by wheels to carry it over the rocks that crossed the drift. Eight of these wheels have recently been discovered in the mines, who are now working in the same old mines. The wheels are made of wood, the arms and felloes of pine, and the axle audt is support of oak, the fabric being remarkable for the lightness of its construction. It is supposed that these wheels cannot be less than fifteen hundred years old, and the wood is in a perfect state of preservation, owing to its immersion in the water charged with the salts of copper and iron. From their position and construction the wheels are supposed to have been worked as treadmills by men standing with naked feet upon one side. The water was raised by one wheel into a basin, from which it was raised to another stage by the second wheel, and so on for eight stages.

A Snail that Lived Seven Years Without a Square Meal.

At a recent meeting of the California Association of Natural Sciences, R. E. C. Stearns read a paper on the annual period of inactivity, torpor or sleep peculiar to the snails and other tribes of the *geophyla*, and which is called hibernation or estivation, according to its occurrence either in winter or summer. In those countries where the winters are cold and accompanied with snow and ice, the sleep of the snail is properly hibernation; where the summers are hot, dry or rainless, as in the greater portion of the Pacific States and in South America, for instance, the period or sleep is in the summer. In the Phillipine Islands, where the climate is perhaps the most favorable for the snail, the period of hibernation or estivation is very short, even if it exists at all. In isolated instances the period of torpor extends to an abnormal length, embracing both winter and summer, and even continuing for several years. A specimen in the British Museum slept four years, and sealed itself up again when it found it could not leave its prison. A most remarkable case came to Mr. Stearns' own knowledge. In 1849, Dr. Veatch brought from Cerros Island a species of helix, specimens of which, sealed in a paper box, came into possession of Mr. Stearns in December, 1865. He was surprised to find a living specimen, which, after being placed in a box of moist earth, in a short time commenced crawling about apparently as well as well as ever. Mr. Stearns' paper concludes: "Fearing from its activity that by some accident it might crawl away and I might lose it, after a fortnight's furlough from its long imprisonment, I placed it in a pill box, marking the date of reimprisonment upon the cover, in order that at some future time I may examine it and ascertain, possibly, if it does not outlive me, how long a snail can live without rations. Here is an instance of a snail living at least six years, in California parlance, without a single 'square meal," and it is probably still alive, though sleeping and perhaps dreaming of Cerros Island, and the snails it left behind." Dr. Veatch mentioned, when Mr. Stearns concluded, that it is common for snail specimens on waking up and finding that they cannot get away, to draw within their sheils, seal themselves up, and go to sleep again, like philosophers, determined to make the best of what they can't help.

Patent Claims.

Interesting to Miners, Millmen, Metallurgists, Oil-Men and Others.

The following claims have recently been issued from the United States Patent Office:

63,351.—GRATE FOR FURNACES.—Hawley Adams, Stamford, Conn., assignor to himself, W. H. Cobanks, and H. Theall, New York City.

I claim a grate for furnaces having its bars, B, extending diagonally across the grate-frame in an unbroken line, in the manner herein set forth.

63 365.—APPARATUS FOR CONCENTRATING AND CONDENSING VOLATILE METALLIC SUBSTANCES.—Joseph C. Coult, San Francisco, Cal.

I claim, 1st. The arrangement of the furnace having fire on two sides, and the openings leading to the ore-chamber, substantially as described and for the purposes set forth.

2d. The soot and spark chamber and the dry compartments, having a continuous supply of cold water surrounding them to hasten condensation and concentration of volatile mineral substances as described, substantially as and for the purpose set forth.

3d. The combined arrangement broadly, as an improvement upon the Coult & Roach concentrator and condensor for the reduction of quicksilver, ores, and the use of steam or water to produce draught to accomplish all substantially in the specification described and for the purposes therein set forth.

63.394.—COLLECTING GOLD FROM RIVER BOTTOMS.—John Johnson, Saco, Maine.

I claim the system herein set forth for the recovery of gold from the beds of rivers.

63.492.—EXTRACTING SILVER FROM ARGENTIFEROUS LEAD ORE.—Clemens Flemming Flach, Call, Prussia.

I claim the improvement in extracting the silver and treatment of the lead contained in argentiferous lead ore, by the means of a blast furnace process, in a manner substantially as described above.

63.557.—DRILLING OIL AND OTHEE WELLS.—Nelson Pontious, Hallsville, Ohio.

I claim the clamping-arms or jaws, I I, clamping the rope of drilling tools in combination with the ratchet wheel, F, with which said jaws turn, substantially as described.

I also claim the combination of the pawls, L L, the walking-beam, the horizontal ratchet-wheel, F, the cams, Q Q, for raising the pawls, L, above the ratchet-wheel, F, automatically, and the slotted connecting-rod, O, substantially as described.

I also claim the vertical ratchet-wheel, M, and its pawl, in combination with the slotted connecting-rod, O, and cams, Q Q, substantially as described.

I also claim the orifice, G, through the ratchet wheel, F, and through the bed-plate, E, and walking-beam, B, in combination with the hinged clamping-arms or jaws, I I, substantially as described.

RE-ISSUES.

2,537.—EXPLOSIVE COMPOUND.—(Div. A.)—The United States Blasting Oil Company, assignees of A. Noble, New York City. Patented Aug. 14, 1866.

We claim nitrine or crystallized nitro-glycerine, produced by the admixture of glycerine, sulphuric acid, and nitric acid, free or nearly free from hyponitric acid.

Special Scientific Brevities.

☞ A letter written from Boutourlinovka, in the Russian "government" of Voronege, states that on the critical night of the 14th of November last, the phenomenon of falling stars assumed a peculiar form. A cross, composed of these meteorites of extraordinary brilliancy, appeared in the eastern part of the heavens. Around this cross there was a ring displaying the colors of the rainbow, within which a number of shooting stars was observed. Two of these stars were peculiarly remarkable: they came from two opposite points—one from the east and the other from the west—met within the circle, struck against each other, and burst with a loud explosion. After this the circle and cross became fainter and fainter, and then disappeared entirely.

☞ At a recent meeting of the California Academy of Natural Sciences, Mr. Gutzkow presented a sheet of chemically pure silver, three feet in diameter, three ounces in weight, and as thin as fine paper. The color was beautifully white, and the texture like fine lace. This sheet was made by mixing solutions of protosulphate of iron and sulphate of silver in a large dish, and the silver rose to the surface, and there formed into a sheet. Successive sheets will rise with each stripping. This easy mode of obtaining chemically pure silver is of much practical value.

☞ Magnesia crucibles are proposed for obtaining compact steel or iron, free from the bubbles which are due to the action of the carbon on the silica of the ordinary crucibles. Lime crucibles for the same purpose may be formed within the ordinary clay crucible, by first ramming the latter with plumbago, then turning out the plumbago to a thin shell then ramming with caustic lime and turning the proper cavity. The use of the plumbago between the clay and the inner shell is to prevent the melting of the latter from contact with the clay in the furnace.

☞ Granulated gun-cotton is offered for military purposes, by a process which consists in reducing the gun-cotton to a paper pulp, solidifying it by pressure, cutting it up, and finally varnishing the grains with collodion. Or the pulp is mixed with a small proportion of gum or collodion, and agitated in a vessel until granulation results.

☞ Mr. J. Bockett has just pointed out a serious defect in the "double objective holder" now used by microscopists. It consists in the want of correspondence between the optical centres of any two object-glasses. Mr. Lockett has contrived an ingenious apparatus for obviating the error.

☞ Dr. Stenhouse, says *Chambers' Journal*, announces that leather may be made waterproof, and its durability doubled at the same time, by applying repeated coatings of paraffine and oil, the absorption being assisted by warmth.

☞ Prof. Whitney, of California, claims that California has the highest mountain in the United States, and that Popocapelt is the highest in North America, but in mass of mountains California excels the Mexican Cordilleras.

Professor Farraday has demonstrated that the electricity evolved during the combustion of a few grains of charcoal or a common candle would, if arranged in a continuous circuit, exceed that of the most powerful batteries.

☞ An inquiry instituted by the British Association has determined the ratio of strength in hot-blast iron as 1,024 3, and of power to sustain impact as 1,226.3, to 1,000 in cold-blast iron.

☞ High-pressure steam has been used in the distillation of mercury.

Mineral and other On-dits.

☞ In the body of a man weighing 154 pounds, there are about 7½ pounds of mineral matter, consisting of phosphate of lime, 5 pounds 13 ounces; carbonate of lime, 1 pound; salt, 3 ounces 3.76 grains—making 7 pounds 5 ounces and 47 grs.—without minute quantities of potash, chlorine, and several other substances. The rest of the system is composed of oxygen, hydrogen, nitrogen and carbon, 111 pounds of the oxygen and hydrogen being combined in the form of water. Though the quantity of some of these substances is very small, it is found absolutely essential to health that this small quantity should be supplied, hence the importance of a variety of food. If we furnish nature with all the material required, she will select such as the system needs, and always just in the proper quantities.

☞ Speaking of the celebrated Comstock Ledge, the Gold Hill *News* says: Here are the croppings of a ledge one mile and a half in length, that gives employment to nearly two thousand miners, about one thousand mill men, five hundred teamsters at least, from three to five hundred lumbermen, five hundred wood-choppers, fifty coal-burners, and a large number of assayers and other men who are directly employed in the mines.

☞ The cast steel of Prussia was worth little over $300,000 in 1850, rose to a million and a quarter by 1860, and amounts now to nearly $1,000,000 per annum. The manufacture of pig, cast and wrought iron has also been multiplied three or four times in the same period, now amounting to nearly $50,000,000 per annum.

☞ A representative collection of rich gold and silver ores from Colorado have gone forward to Paris, comprising some 3,000 specimens, taken from the principal mines of that Territory; also a large quantity of gold nuggets, and photographs and maps of the mining regions.

☞ The *Quebec Chronicle* states that a gentleman who has, during the last seven years, been exploring the country on the north shore of the St. Lawrence, has discovered a vein of coal extending over a large district, as also copper, plumbago, steel and iron mines, with petroleum springs.

☞ The Avery Island (La.,) salt mine is said to be the finest in the world. The mine is inexhaustible and the material pure as crystal, containing 99 per cent. of pure salt. It has a working company with a capital of $2,500,000.

All Sorts.

☞ The western papers report, among other items of interest concerning the number of emigrants finding a home there, that there were seven hundred and eighty-three emigrants who passed through one town, (Columbus, Ohio,) during the week ending Saturday, March 16. According to the careful calculation of Chief Justice Chase, these seven hundred and eighty-three emigrants represent $783,000 added to the industry and wealth of the West in one week, and all, perhaps, to the same neighborhood.

☞ A Nevada paper remarks: Most people would suppose that the interior of our mines, deep in the bowels of the earth, are very warm, and so they are usually, but in the Kentuck mine the draught in the shaft through the Yellow Jacket works is so great as to render it almost impossible to keep a candle lighted, and the recent intense cold weather congealed whatever there was of moisture, and icicles several feet in length formed on the casing of the shaft.

☞ During the process of extinguishing the fire in the colliery of Clackmannan, near Stirling, Scotland, in 1851, about 8,000,000 cubic feet of carbonic acid gas were required to fill the mine, and a continuous stream of impure carbonic acid was kept up night and day for about three weeks. The mine extended over a surface of twenty-six acres, and had been thirty years on fire.

☞ David Johnson, who had charge of the government coal fleet at the Mound City (Ill.) navy yard for several years, has committed suicide, because, through a mistake of his in measuring, the government lost four hundred bushels of coal. If all the government officials had like tender consciences, and acted on them the same, how many positions would be vacant.

☞ Mr. Pullop, coming home late, "pretty full," finds the walk very slippery, and he exclaims: "V-v-very singular; wh-whenever water fr-freezes, it alius fr-freezes with the sl-slippery side up. Singular!"

☞ A widow lady sitting by a cheerful fire in a meditative mood, shortly after her husband's decease, sighed out: "Poor fellow—how he did like a good fire! I hope he is gone where they keep good fires!"

☞ By acting as we ought to think, we end by thinking as we ought to act.

☞ Punch thinks the Mormons have *Utah*-lized their territory.

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MINERAL AND OTHER ON DITS.

THE STRIKES AMONG THE MINERS—WORDS OF ADVICE—ABOUT THE COUNCIL OF THE PRUD'HOMMES IN FRANCE.

It is an axiom in political economy that the rate of wages depends on the proportion between the working population and the capital used to pay labor. Thus wages rise on an increase of this capital, or on a decrease of laborers. When money is scarce and labor plenty, less is paid for work, and should the prices of provisions, &c., be high, there is likely to be serious distress among the working classes, resulting in illegal combinations to raise wages. This we find exemplified in the numerous strikes which have lately taken place in many parts of the Eastern States, where there is a comparatively large laboring population, and an unwillingness on the part of capitalists to increase what they consider the present high rates of wages. Among the most important of these trade demonstrations are those which have been made by the iron miners of New Jersey, and the coal miners of Pennsylvania. In the mines of New Jersey the men are paid about $1 65 cents a day, and this they consider, owing to the price of the necessaries of life, to be quite insufficient for the support of themselves and their families. They have accordingly refused to labor in the mines unless their pay is increased, the consequence being that twelve mines are now deserted, and two thousand workmen are out of employment. Of this number considerably more than one half are willing to return to work, but are intimidated by a violent minority. No right-minded man can say anything in favor of strikes. Those who engage in them may have wrongs to complain of; they may be under-paid, and badly treated, but they have remedies which are neither foolish nor illegal. Every one is at perfect liberty to work for what he pleases, and if he considers that he is not sufficiently paid, he has a right to leave his employer's service for better, but it surely is not just that he should force those who are willing to work for moderate pay, to throw up their position to suit his views of redress. And this is what is done in strikes. But apart from the question of right, we believe that these combinations are very rarely effective of good. Should they prove successful, it is only after a long period—in which the workmen are idle, and, of course, receiving no wages. In such contests, however, the capitalist is nearly always the victor, and we believe that it will be so in New Jersey. We wish that this and all similar differences between masters and workmen could be amicably arranged. So much depends on the good feeling exsiting between them, that it is a matter of regret that, for the settlement of all such disputes, there is not an institution which would command the confidence of both classes, and the support of the law. The council of the Prud'hommes in France has been found to work well. In 1858, seventy-two of these councils arranged 28,699 causes of complaint, while but 2,141 appealed to higher authority. The average number of cases annually submitted from 1841 to 1845 was 18,201, and in ten years it had doubled, being in 1851—'55, 40,696, thus showing the growing favor of the council. Those engaged in the present strike we strongly recommend to return to their work. By remaining away they can do no good; they are impoverishing themselves, and lessening the power of their masters to increase their wages. If they cannot earn enough in New Jersey, let them go to the West, and, among the gold fields of that region, they may acquire the wealth which there always rewards honest toil.

FATAL COLLIERY EXPLOSIONS—CULPABLE NEGLIGENCE.

In our mining summary we give the details of a recent catastrophe in the "Bright Hope" (a sad misnomer) pit at the Clover Hill mines, Chesterfield, Va., an accident the most appalling which has ever occurred in our collieries, and which we believe might have been avoided had the necessary supervision been exercised. From the evidence of Mr. Cox, the former Superintendent, it appears that the arrangements for ventilating the "Bright Hope" were so complete that, if faithfully executed, there would have been no explosion. To see that these regulations were carried out was entrusted to an experienced miner, seventy years of age, and to two deputies. The duty of the chief was to ensure that his subordinates ascertained, several times a day, that there was no accumulation of gas, and that the mine was safe for the workers. Some time since a door at an upset had been removed and was not replaced, as was ordered. It is stated that the young man whose duty it was to examine this place in the morning failed to do so. The explosion is supposed to have been caused by the gradual accumulation of gas at this upset, igniting from a lamp belonging to one of the male-drivers. It may have been caused by one of those sudden outbursts of fire-damp which Prof. Rockwell described in his paper on the Oaks colliery explosion, contributed to the JOURNAL OF MINING, and against which it is difficult to guard; but whether this is so or not, we are of opinion, from the facts before us, that those in charge of this mine have not been sufficiently careful of the lives entrusted to their care. Regulations for the proper ventilation of mines are necessary, but they are absolutely useless unless they are exactly carried out. To assign the important duty of seeing this done to an old man who has already reached the allotted term of human existence, is a serious error of judgment. His experience may be great, but he has not the physical power to labor much, and it requires great activity, as well as knowledge, to perform this work satisfactorily. In the present case we see that his orders to have the door at the upset replaced were disobeyed, and even the surviving deputy admits that he did not visit that part of the mine, one of the most dangerous places in it under the circumstances. It is suspected that his unfortunate colleague, who perished in the pit, was similarly unfaithful. There can be no question at all of the carelessness of the deputies, and of the want of due supervision. And this is not the first accident that has occurred in this neighborhood. Since the year 1850 numerous explosions have taken place, more or less fatal. By this one sixty-nine human beings unexpectedly were hurried out of life, and two hundred and thirty-three depending on these toilers for subsistence are thrown on the generosity of the charitable. If another example were needed to show the necessity of careful supervision in coal mines, this surely ought to supply it, but we fear that its lesson will soon be lost, and that ere many months it will be our duty again to complain of carelessness as culpable as that which produced this explosion.

Our New Territory.

The Senate has ratified the Russo-American treaty, and all that now remains is for the House to appropriate the ten millions of dollars to bind the bargain, which, without doubt, it will do. We look forward now to the rapid development of our new territory, by hardy Western pioneers, who will, undoubtedly, prospect it thoroughly for the precious metals. Look out for a "stampede."

Luminous.

The San Francisco *Mining and Scientific Press* assures the New York *Mining Journal* (what's in a name?), that sodium amalgam is not a dangerous compound, but that the metal sodium is!

THE SCHOOL OF MINES OF COLUMBIA COLLEGE.

The Course of Study—The Mode of Instruction—Practical Science—Progress of the Institution—Its Importance to the Country—Its Wants.

We recently visited this valuable institution, and it may not be uninteresting to our readers to hear how we were impressed with what we saw there. The object of the School of Mines is to enable students to acquire a thorough scientific and practical knowledge of those branches of science relating to the mining and working of our mineral wealth, and to supply to those engaged in mining and metallurgical operations, persons competent to take charge of works, and conduct them on scientific principles. There are two classes of students, those who study the full course, and are candidates for the degree of Engineer of Mines, or higher, and those who devote attention to any particular branch in which they wish to excel. These latter are called special students, of whom there are now about forty attending lectures, and practice in the laboratories. Candidates for admission to the privileges of the full course, are required to pass a satisfactory examination in algebra, geometry, and trigonometry, and those who seek advanced standing are examined in all the subjects studied by the class which they propose to enter. The regular matriculation takes place on the Wednesday preceding the first Monday in October. When the student of the first year has passed the preliminary examination, he is introduced to the assistant in charge of the chemical laboratory, who supplies him with a place in that department. Here every convenience is afforded him to pursue practically his study of the lectures on qualitative

analysis which he attends. On a shelf before him are arranged his chemicals, properly numbered and labelled, and in the drawers of his table are his apparatus. His first exercises in chemistry consist in recognizing the bases and acids, and then, as he progresses, he is practiced in discovering the constitution of various compounds, similar in many respects, such as color, but totally different in composition. In this he is directed by the assistant, to whom he refers all his difficulties, and from whom he learns the most practical way of becoming acquainted with the theories already stated in the lecture-room by the professors. Besides his chemical studies, the student, in the first year, devotes his attention to drawing, stone-cutting, mine surveying, mineralogy, physics, analytical and descriptive geometry, the calculus, and a modern language. His drawing lessons have special reference to machines, at first merely making copies, and afterwards sketching and filling in side and front elevations of complicated machinery. In mineralogy, besides attending the lectures, in which the principles of the science are lucidly explained, the student has, as in all the other branches, an opportunity of becoming acquainted, under direction of a qualified assistant, with the forms of crystallization, and the means of determining minerals by their physical and blow-pipe characteristics. The number of hours weekly devoted, in the first year, to lectures, is seventeen; so that a very great length of time is allowed for practice in the laboratories, and study in the museum or library. In the second year, the chemical studies are devoted to quantitative analysis, on the same principle as those of the first year—the professor lecturing on the theory, and the students, under the direction of the assistants, testing, and becoming acquainted with the practical truths of the science. The quantitative laboratory is a spacious, well-lighted room, with everything necessary for an accurate study of this important branch. At one end the balances are kept for determining the weight of the substances discovered in analysis, and, so accurate are some of these, that they can determine the difference in weight between two hairs of equal length. At the opposite end there is a partition dividing the main portion of the laboratory from that in which all processes entailing the exhalation of noxious fumes are carried on. Very proper arrangements are made for the ventilation of this apartment. In addition to chemistry, students of the second year attend lectures on general geology, metallurgy, blow-pipe analysis, exploitation and mechanics. The study of metallurgy is conducted with great care, a written opinion on the best means of treating all peculiarities which in the course of practice are met with, and the reasons for adopting any method in particular, being required in each exercise. More time is given for practice in this year. In the third year the student, besides continuing his studies on metallurgy, exploitation, etc., mining engineering, economic geology, and the theory of veins, enters the assay laboratory. Here, with all modern appliances at his disposal, he determines both by the dry and wet way, the quality and quantity of metal contained in ores.

A few words as to the manner of instruction may not be superfluous. The professor in the first session explains the leading principles and theories of the science to his class. During the hours not devoted to lecture, the students, as already explained, endeavor in the laboratory or cabinet to practically test their knowledge of those principles, seeking aid and direction from the assistant in all difficulties. These assistants, besides being students, who read their course with great distinction, have the advantage of constant communication with the professors, and attend a class weekly over which the Dean of the Faculty presides. In this they have an opportunity of submitting all doubts, and receiving advice as to the best means of making their fellow workers in the laboratory, practical men. In the second session the lectures are less professorial, being more of a catechetical style, the professor ascertaining, by interrogation, the knowledge acquired by each student. Of the excellence of these methods it is quite unnecessary to speak. They are well suited to impress on the students the principles of the science, as a science, and to familiarize them with their practical utility. This appears to be the great object of all the instruction of the School. Even the vacations are devoted to the acquisition of practical knowledge. It is expected that each student will visit, during recesses, metallurgical establishments, manufactories, and mines, collect geological specimens, etc. On his return he hands in a journal of his travels, and a memoir on some subjects assigned to him. This is an important feature of the studies of the school, and is faithfully carried out, some students going to Europe and California for the purpose.

The student having completed his course, attended all the lectures prescribed, made all the analyses and assays, written all the *projets* and memoirs, is admitted to an examination for the degree of Engineer of Mines or Bachelor of Philosophy. The exercises for this are very severe, being conducted by oral, written and experimental examination, embracing the whole course of study. A graduate of the School of Mines will be well worthy of his degree. The fact that study at this school is entirely voluntary, ensures great attention on the part of the students who are all earnest, hard working men. "They are *sent* to college, but they come to the School of Mines," was the satisfactory answer given to the question, did the students labor hard? A number of scholarships and prizes have been established to reward the industry and success of the student, and in case of extraordinary merit permission is obtained to work in particular mines. The school also obtains appointments for its more distinguished scholars. The relations between the professors and students appeared to be of the best possible nature, the former taking a deep interest in the welfare of those under their care, and the latter offering to their teachers that respect which, in the first flush of manhood, is instinctively paid to superior intellect or knowledge. The expenses are not very large; the fee for the whole course being but $200 per annum, and even this is not always required. The School of Mines is now three years in operation, and some of its *alumni* fill responsible positions, and at present it has almost one hundred and twenty on its roll. Its first beginning was very small. From Columbia College it obtained permission to make use of any of their unoccupied rooms, and in the cellars of the Academic Institute the first lectures were given; but "they had forty-eight students," and they were determined to succeed. By the efforts of a generous citizen, funds were collected to give them a start, and within the past three years they have spent $100,000; quarter of which was derived from fees, and the remainder from the funds of the College. Of this sum $50,000 has been expended in salaries and supplies, and $50,000 in building, and fixtures of a permanent kind. Of the character of the apparatus, of the museums, laboratories, instruments, etc., of their completeness and general fitness, it is scarcely necessary to speak. Every appliance which modern skill could suggest is made use of; even the window blinds are utilized to bring constantly before the minds of those studying metallurgy, different qualities of the metals. Such efforts to attain excellence, by being practical as well as scientific, must ensure success, and before long we hope that no student will leave this country to receive his mining education in Germany or England, where the system of working ore is totally different from ours. We endeavor to extract only as much from the ore as will pay; the European miners try to get every grain of metal, at a cost of labor and time which in this country would be ruinous. Complaints, too, have reached us, that at Friburg—where there are thirty-seven American students—"the laboratory and lectures on metallurgy" are not as good as might be expected. German engineers have to unlearn much of their theories before they can work satisfactorily here. But as a national institution, it merits support, and we trust that it will receive it, in contributions to its funds, so as to enable it to erect a large metallurgical laboratory, geological museum, and a lecture hall in which popular instruction might be given. An endowment of $1,000,000 would be profitably spent in enlarging its sphere of action. It has done much, and we are confident that with increasing facilities, it will prove of immense advantage to the country.

Scientific Meetings.

AMERICAN INSTITUTE—POLYTECHNIC BRANCH.

CORRUGATED IRON—A NEW SCREW FOR PROPELLERS—INCRUSTATION—A QUESTION OF ORDER—MOLECULAR FORCE.

Mr. Richard Montgomery brought before the Polytechnic on the last evening of meeting specimens of corrugated iron. He claims that if used in the construction of boilers it prevents incrustation and exposes a larger surface to the action of the heat. He is of opinion that any latent defect in the iron will be detected by the very severe test of corrugation. Iron is "corrugated" by passing a heated sheet of that metal through immense indented rollers. So strong is this said to make iron that a plate 3-16's of an inch, without braces, resisted a hydrostatic pressure of one hundred and forty pounds. Mr. Wiard was of opinion that corrugation deprived iron of its elasticity. A lively discussion followed and was continued for some time.

Mr. W. E. Davis submitted a new propeller, in which the fans of the screw are made very strong and light. Screws generally break at the connection of the bucket with the shaft, and after breaking are useless. This, besides lessening the chance of fracture, can, in case of accident, be easily repaired.

Dr. Bradley, on behalf of Mr. Hayes, explained an invention which is said to work satisfactorily in preventing incrustation on boilers. It accomplishes this by passing a current of electricity through the boiler, which connects the positive and negative poles of a battery. Dr. Parmelee was understood to express an unfavorably opinion in regard to this invention. Mr. Wiard stated that in Philadelphia some hundred locomotives were constructed with electrical apparatus, to prevent incrustation. He was not aware of the nature of these additions. Mr. Harrison believed that they were such as had been described to him by Dr. Van der Weyde, consisting of a number of points in the steam space, which, by means of a lightning rod, drew off the electricity from the vapor, and diffused it in the atmosphere.

Mr. Johnson was anxious to bring the Institute some further details about his claim to the honor of having taken the first photograph from life. As this question was at the preceding meeting referred to the Chemical Committee, the Chairman considered it out of order to take it from their hands. In this decision he was supported by the voice of the meeting.

Mr. Walling explained, by means of diagrams and models, theories which he has formed as to the cause of force, heat and crystallization.

Correspondence.

[To insure insertion of Correspondence in our columns the full name and address of the writer must be given.]

The Mining Interests and the Pacific Railroad.

NEW YORK, April 8, 1867.

EDITORS JOURNAL OF MINING:

GENTLEMEN—Every year of the past ten, since a Pacific Railroad was talked of, has added to its importance, first mineral, then social, then commercial, then military, then agricultural interests; and, finally, the national prestige—all successively and imperatively demanded it. This line consists of two great divisions, one starting from California, and the other running from the East westward. So far back as 1861, a company was formed to build a road from the Pacific eastward till a connection was formed with the eastern line, and in 1863 the work was begun at Sacramento. At this side, the line made little progress, owing to the war. In 1862, so great was the military and commercial necessity of the road, that Congress granted very large amounts of public land to such companies as would undertake the execution of this great work. Its assistance in sustaining the capitalists engaged in this work, by pledging its credit to an amount nearly half sufficient to build the road, was also given. In 1864, the companies at each end of the road were authorized to issue a number of first mortgage bonds, "of equal amount, and alike in tenor, date, time of maturity, and kind of payment, as the bonds issued by the Government, to be a first lien on the road, its properties, franchises, &c." Impelled by such aid, the eastern section of the Union Pacific Railroad, has completed three hundred miles west of the Missouri, and it is expected that, at the end of this year, it will reach the Rocky Mountains, two hundred miles farther. At the other end, the Central Pacific Company, less influenced by war, and inspirited by the immense traffic of the region through which it is to pass, worked hard to accomplish its task. The wealth of California enabled her to employ a large number of laborers on the road, and sufficient inducement had she to do this. Thirteen millions a year had been spent in hauling freight across the high mountains separating her from the territories, exclusive of the return freight upon double that sum of precious metals. Need we wonder they worked with all might at their work, and that, in November last, they had nearly 100 miles of road in running operation. But when we remember the nature of the country, and its distance from supplies, this length will appear relatively much greater. By the end of this year the Union Pacific will be at the eastern base of the Rocky Mountains, a hundred miles north of Denver. This will enable the mining regions of Montana to reach the railroad by a stage ride of twenty-four hours. It will also drain the extensive regions in Central and Western Colorado, Pike's Peak, and the West.

On the other end the progress will be even more beneficial. The silver product of the Comstock region in Western Nevada is fifteen millions a year. This is to be within twenty-two miles of a continuous railroad in July next. Fuel, rent and food are necessarily high in Nevada, and these will be directly affected by the railroad across the mountains. Further on in December, the road will approach within 150 miles of the famous Idaho gold region around Boise City. In six months thereafter it will be approaching Salt Lake City, the Reese River silver mines, and the equally celebrated Pah-Ranagat mines, all of which, under the fertilizing influence of the railroad, may be expected to leap into astonishing activity. The Californians and Oregonians are already shipping large quantities of wheat, wine, &c., to the Atlantic coast. A new and promising market for her superabundant produce will then be opened.

The difficulties of this work can be understood when we remember that the Sierra Nevadas were crossed at a height of 7050 feet. This rise commences seven miles east of Sacramento, and attains its greatest elevation one hundred miles farther on. The following table, taken from the report of the Central Pacific Company, will show the rate of progress, and the elevation above the sea level:

January 1st, 1865, to New Castle	31 miles		930 feet.
May 15th, 1865, to Auburn	36	"	.....
June 10th, 1865, to Clipper Gap	42	"	...1660 "
September 4th, 1865, to Colfax	56	"	...2418 "
May 8th, 1866, to Secret Town	66	"	...3415 "
July 10th, 1866, to Alta	73	"	...3700 "
November 20th, 1866, to Cisco	94	"	...5911 "

Near Cisco, the summit is to be pierced by a tunnel 1658 feet. For twenty miles east of the summit, the grading is ready for the rails, which will be laid as soon as the excavation of the tunnel is complete. The ascent on the western side of the hill is 7000 feet, and on the eastern declivity only 1200. What the earnings of this line will be, may be gathered from the following table of the work of seventy-three miles in August, September, and October, 1866—a season when freight can be more easily teamed across the hills.

Date, 1866.	Gross Earnings.	Operating Expenses.	Net Earnings.
August	111,770 35	25,148 32	86,622 03
September	114,400 00	25,168 56	89,231 44
October	127,065 96	18,554 55	108,511 41
Total	$353,236 31	68,871 43	284,364 88

From these statements readers of the JOURNAL OF MINING can form some idea of the importance of this great undertaking. A. B. C.

NEW PUBLICATIONS.

ASSEMBLY DOCUMENTS, No. 71. April, 1866. By S. H. Sweet, late Deputy State Engineer.

This valuable State document for reference was prepared in 1865 for the State Engineer, W. B. Taylor, and published last winter as one of the public documents of the assembly. It is only this winter that it has been distributed by the members of last year's Legislature. We notice some of its failures and omissions, that, in any future issue, they may be amended, if justly made. In the chapter on the origin, distribution and classification of Coal, our author states that "the coal measures are *only* in the carboniferous age—in the sixth period before the age of man." This was the opinion advanced many years ago, but is too aged for modern investigations. In the six great ages mentioned in the next paragraph, viz., the azoic, silurian, devonian, carboniferous, reptilean and mammalian, coal is found in Portugal in the silurian, in the United States in the devonian, in the United States, British Possessions, South America, Africa, China and Japan, it is found in the reptilean. Probably a larger area of Coal is to be found on the earth's surface in this age, than in all previous ages. If the word "only" had been omitted on page 5, line 14 from top, the paragraph would be nearly correct. It is a pity that in the two maps delineating the outlines of the carboniferous coals of Pennsylvania, they had not been made alike, and a little more perfect in detail. If a copy from Rogers' great geological map had been made, we shouuld have had one nearer the truth. When it is as easy for a State to publish a correct one, falsities are the more reprehensible. In the Report, no allusion is made to the northwest prolongation of the coal measures nearly to the State line, along the Alleghany river. Cameron, Elk, Forest, Potter, McKean and Warren, all have portions of this extension, and which do now largely, and in the future will much more largely, contribute fuel to the western portion of New York State. The Buffalo & Bradford railroad has tapped this extension in McKean county, and distributes coal along the New York & Erie road from Lake Erie to the Hudson. The Alleghany Valley canal extension approaches within twenty miles of it. The Philadelphia & Erie railroad cuts through it from Cameron to Warren. The Buffalo & Washington railroad will cut through it from Emporium northward. Its beds contain good gas coal, caking coal and grate coal. From this basin, via the Pennsylvania Canal, gas and bituminous coal can be delivered in this market cheaper than by any other route.

MINERAL RESOURCES OF THE WEST. (SPECIAL COMMISSIONER J. ROSS BROWNE'S REPORT ON THE RESOURCES OF STATES AND TERRITORIES WEST OF THE ROCKY MOUNTAINS.)

We are indebted to Hon. Wm. A. Darling for this public document, already noticed in some particulars in the columns of this journal.

STATEMENTS.

PLYMOUTH GOLD AND SILVER MINING COMPANY OF MONTANA.

We have received a printed statement of the prospects, etc., of this company. According to it, the property is located in Madison, Edgerton, and Deer Creek counties, Montana Territory, and consists of thirteen thousand feet of rich gold and silver-bearing quartz lodes, and five hundred acres of timber and farming land in their immediate vicinity. Among other lodes mentioned, we notice the "War Eagle," "Wild Pilgrim," "Lion," "Romulus," "Remus," and "Cortez," various assays of ores from which vary from $400 to $1400 per ton; shafts, varying in depth from 20 to 50 feet, have been sunk upon all of the company's mines, affording indication that they are *true fissure veins*, and giving evidence of their richness in the precious metals. The report closes with the statement that "It is the design of the company to proceed in the development of such of its mines as have proved the richest, and to establish works for reduction of the mineral as speedily as a prudent expenditure of their funds will permit. A rigid economy will be observed throughout in the management of its affairs, and no experiments, or processes not well understood, will be undertaken, and no money expended that shall not directly apply to the extraction of the mineral, or its conversion into bullion." We notice that David S. B. Bennett, Esq., 164 Duane street, New York, is secretary of this company.

MEETINGS.

Bates and Baxter Gold Mining Co., at 97 Gold street, April 17, between 12 and 1 o'clock; Delaware and Hudson Canal, at No. 7 Nassau street, May 14th, between 12 and 2; Colorado Gold Mining Co., at 506 Walnut street, Philadelphia, April 25th, at 12 M.; Cambria Iron Co., at 400 Chestnut street, Philadelphia, April 23d, at 4 P.M.; New England Slate and Tile Co., at 14 State street, April 18th, at 12 M.

DIVIDENDS.

Imperial Silver Mining Co. of Nevada, $116 (gold); Crown Point Silver Mining Co. of Nevada, $80 (gold); Ophir Mining Co. of Nova Scotia, at 13 Doane street, Boston, 25 per cent. on 20th inst. to stockholders of 15th inst.

ASSESSMENTS.

Adams Mining Co., $2 per share.

MARKET REVIEW.

FRIDAY EVENING.

Gold and Silver Stocks—At the First Board, Alameda sold at $8.65@8.70; Columbia G. & S., $3.45, an advance of 20c. during the week; Corydon, $5.10@5.20, an advance of 50c; People's G. & S., 50@60c, a fall of 45c; Quartz Hill, $2.38@2.40; Rocky Mountain, $1.10; Smith & Parmelee, $5@5.20, a tumble of $1.

	April 5. Offered.	April 5. Asked.	April 12. Offered.	April 12. Asked.
Alameda	8 45	8 50	8 70	8 70
American Flag	90	1 00	81	95
Atlantic and Pacific	....	2 35	1 00	2 00
Bates & Baxter Gold	1 50	2 25	1 25	2 00
Benton Gold	1 00	1 25	1 00	1 10
Bobtail Gold	....	3 00	1 00	3 00
Boscobel Silver	....	5 00	....	....
Bullion Consolidated	....	1 00	....	1 50
Burroughs Gold	....	25	....	....
Central Gold	....	20	....	....
Crozier Gold	2	10	....	....
Columbian G. & S.	3 20	3 25	3 40	3 50
Consolidated Colorado	....	10	....	10
Consolidated Gregory	8 40	8 50	9 00	9 15
Corydon	4 60	4 65	5 15	5 20
Des Moines Gold	....	75	....	....
Downieville Gold	....	20	....	8
Gilpin Gold	....	3 00	....	....
Gold Hill	3 00	4 00	....	4 00
Gunnell Gold	4 70	5 95	4 25	4 70
Gunnell Union	....	45	....	50
Grass Valley	....	1 75	2 50	2 60
Holman	10	20	....	20
Hope Gold	....	....	....	75
Keystone Silver	....	3	1	2
Kipp & Buell Gold	55	65	55	70
La Crosse Gold	40	50	40	50
Liebig	30	....	....	5
Liberty Gold	3	5	....	....
Montana Gold	55	75	40	55
New York	60	1 00	60	90
Nye Gold	3	6	3	6
Ohio & Colorado G. & S.	....	....	....	65
People's G. & S. of Cal.	95	1 25	....	60
Quartz Hill	2 55	2 60	2 35	2 40
Reynolds Gold	3	8	....	4
Rocky Mountain Gold	1 00	1 10	95	1 10
Smith & Parmelee Gold	5 70	5 95	5 00	5 10
Sensenderferfer	....	29 50	10 00	13 00
Symonds Fork	1 50	....	....	1 40
Texas Gold	16	18	....	20

Copper Stocks. 400 shares of Charter Oak sold at $1 85 at first board; a slight advance for last week's quotation.

	April 5. OFFERED.	April 5. ASKED.	April 12. OFFERED.	April 12. ASKED.
Caledonia	....	15 45	....	15 60
Charter Oak Copper	1 75	1 76	1 83	1 85
Davidson Copper	....	1 75	1 30	1 50
Hilton Copper	....	2 00	....	....
Isle Royal Copper	....	8 00	....	8 00
Ogima Copper	....	8 00	....	6 00

Lead Stocks.—Sales to-day were as follows: 800 shares Walkill ar 35c.; 200 at 34c.; 100 at 33c., and 500 s. 3, at 31. An average decline of 22c. since last Friday.

Petroleum Stocks.—5,000 shares of Cherry Run special sold at first board b. 3, at 10c.

	April 5. Offered.	April 5. Asked.	April 12. Offered.	April 12. Asked.
Bennehoff Run	2 25	2 75	2 30	2 75
Buchanan Farm	....	20	....	19
Central	70	....	70	1 00
Clinton Oil	....	1 40	....	1 30
Cherry Run Special	....	....	....	7
Excelsior	....	20	....	20
Manhattan	....	15	....	15
N. Y. and Alleghany	....	4 50	....	4 50
Pit Hole Creek	40	75	....	75
Rynd Farm	6	....	6	20
United Pet. Farms	5	15	5	....
United States	3 25	3 50	3 50	4 00

Miscellaneous Stocks.—Wells, Fargo & Co., 65@67½; Pacific Mail SS. Co., 124⅞@125½; Cumberland Coal, pref., 29; Quicksilver Mining Co., 28½@28¾; Delaware and Hudson Canal Co., 1 45.

Government Stocks.—The following has been the range of quotations during the morning:

U. S. 6s, 1867	131½@	..
U. S. 6s, 1868, coupon	129	@
U. S. 6s, coupons, 1881	109	@109¼
U. S. 5-20s, 1862, coupon	109¼	@109½
U. S. 5-20s, 1864, coupon	107¾	@108
U. S. 5-20s, 1865, coupon	108	@108¼
U. S. 5-20s, 1865, coupon, new	107⅛	@107¼
U. S. 10-40 coupon	97⅞	@ 98
U. S. 7-30, 1st	106	@106⅛
" 2nd	105⅜	@105½
" 3rd	105⅜	@105½

Foreign Exchange is dull, but firm. Bills at 60 days on London are quoted at 108¼@109 for commercial; 109¼@109⅝ for bankers'; do. at short sight, 109¾@110¼; Paris at 60 days, 5.20@5.15; do. at short sight, 5.15@5.12½; Antwerp, 5.20@5.17½; Swiss, 5.20@5. 17½; Hamburg, 36@36¼; Amsterdam, 40¾@41⅜; Frankfort, 40⅞@41¼; Bremen, 78½@79¼; Prussian thalers, 71⅞@72¼.

Gold.—Was excited at 136¼@137.

Copper.—Quiet, Baltimore selling at 23@23½c. We quote Lake 23@23½c.

Iron.—The market in Pig is dull, American No. 1 selling $40@41. We quote No. 2 at $35@37. Wm. Outhout reports in the retail trade inactivity with a slight improvement. Prices range as follows: Swedish iron, $155@165; common, $95@100; refined, $105@110; band, $137½; rods, 5-16 to ⅝, $110@170; scroll, ⅝ to ⅞, $187½@137½; horseshoe, $122½@137½; hoop, ⅝ to 2, $142½@200; ovals and half ovals, ⅝ to 1½, $132½@142¼; nail-rods, $9@10¼.

Tin.—Dull. We quote Banca at 25@25c gold. Prices for Straits range from 21 to 21½c. gold.

Lead.—Very dull. Selling at 6½c. gold.

Spelter.—Very dull. We quote it at 6½@6¾c. gold.

Petroleum.—Is quiet at 16c. for crude, and 27@28c. for refined, in bond.

THE SLATE TRADE.

Roofing Slate.—There is very little doing and prices have a downward tendency, and if the yield at the quarries continues as at present we may expect a still further decline. Our quotations this week show a reduction of fifty cents per square all through. These prices are, however, nominal, there being no sales. We notice a great many producers in town offering their slate very low, probably to test the market. The fact is, they have all their money piled up at the quarries and feel the necessity of turning it over.

Affairs at the quarries are quiet, and are likely to remain so as long as slate moves slowly.

It will be noticed in the "Mining Summary" of this week that Minnesota talks of putting slate on the Western market. It is said to be of superior quality, and those interested argue that Eastern slate will find in it no little opposition. We think it will take a few years to develop the quarries sufficiently to produce a quality of slate that can compete successfully with that turned out by the old quarries of Pennsylvania and Vermont, but we trust this fact will not dampen the ardor of our Minnesota producers. Let them send their slate into the Western market and we shall be happy to quote it in the Journal of Mining among the others.

The Northern canals are not expected to open before the 1st of May. Boats, however, are running on the river, in consequence of which the railroads have reduced their rates fifty per cent., and when the canals open a further reduction may be expected. Rates from Troy to the city are now 14 cents per 100 lbs., and from Hydeville to Troy 15 cents per 100 lbs. No slate has yet come through the Lehigh canal. We have not received the Summer Tariff of the Lehigh Valley railroad.

Roofing Slate.

Vermont purple, 1st quality, per square				$11 00@12 00
" " 2d " "				10 00@11 00
" green, 1st " "				11 50@12 50
" " 2d " "				10 50@11 50
" red, 1st " "				12 50@13 50
" " 2d " "				11 50@12 50
Pa. bl'k & d'k blue, 1st " "				10 50@11 50
" " 2d " "				9 50@10 50

PRICES DELIVERED. PER SQUARE.

Chicago.—Vermont purple and green, 1st qual.				$14 00@15 00
" " " " 2d "				13 00@14 00
" " red 1st "				15 00@16 00
" " " " 2d "				14 00@15 00
Penn. black 1st "				15 50@16 50
" " " " 2d "				14 50@15 50

Buffalo.—$2 or $3 lower than Chicago.
Cleveland.—$1 higher than Buffalo.
Cincinnati.—50 cents higher than Cleveland.
New Orleans.—$19@20 per square.
Charleston, S. C.—$15@16 per square.

THE COAL TRADE.

No new feature has characterized the coal trade during the past week. Dealers complain of dullness and very few orders. This state of affairs cannot continue much longer, as many of the stocks on hand in the retail yards and among manufacturers are very light and will have to be replenished. A correspondent, who has just made a tour of the principal ports down East, states that dealers are much in want of coal, but fearing prices may recede, are holding off. We are satisfied they will wait in vain.

The strikes in the various regions are still in progress, and have extended to the iron and bituminous coal mines as well. When these men be convinced of what is to their own interest? We hoped to chronicle an abatement of them this week, but in those districts where there seemed to be a probability of the men returning to work, we hear of renewed depredations.

The Delaware & Hudson canal is now in full operation, boats having cleared from Rondout on the 18th ult. and are now arriving freely at that place with coal from Hinesdale.

At the monthly meeting of the Directors of the Baltimore & Ohio railroad, held in Baltimore on the 13th of March, "the rate of transportation on coal from Cumberland and Piedmont to Baltimore, was reduced thirty cents per ton, and on gas coal from Newburg, Fairmont and Clarksburg fifty cents per ton; also a corresponding reduction of way rates for coal upon the road and branches, all of which to take effect on the 18th ult. The rates from Cumberland to Locust Point shipping wharves will be reduced, under the resolution, from $5 to $2 70 per ton, and from Piedmont to the same point from $3 35 to $3 05 per ton. These rates reduce the transportation to the figure of one and a half cents per ton per mile."

The Canals.—Though the canal is in navigable condition throughout its entire length, but a small quantity of coal has yet been shipped. Only one or two companies are doing anything. The hitch, we understand, is between the companies and boatmen, with respect to rates of freight, the boatmen asking $1 50 per ton, while the companies are indisposed to pay over $1 25.

The Schuylkill navigation is now in good boating order throughout the entire line, and business has fairly commenced. The spring tariff of tolls is as follows: Tolls by canal from Schuylkill Haven to Philadelphia, $1 00. Freights from Schullkill Haven, including tolls by Raritan canal to New York, $2 20. Out of which they allow a drawback of twenty cents per ton, on shipments to points between, including New Brunswick and Stonington, and fifty cents east of Stonington. They allow a drawback on shipments south to points their boats cannot reach, of forty cents per ton—meaning, it is understood, to points below Salem, on the Delaware.

The Delaware, Lackawanna & Western Railroad Company have issued the following circular:

New York, April 12th, 1867

The Delaware, Lackawanna & Western Railway Company will sell, by Messrs. John H. Draper & Co., Auctioneers, at the Company's sales room, 26 Exchange Place, corner of William street, New York, on Wednesday, April 24th, inst., at 12 o'clock M., 80,000 tons of fresh mined coal, from the Lackawanna regions, of the usual sizes, deliverable at their depot, Elizabethport, N. J., during the month of May, 1867. The sale will be positive; each lot put up will be sold to the highest bidder; no bids, in any form whatever, being made for account of, or on behalf of the Company. The conditions will be fully made known at the time of sale.

Terms: Fifty cents per ton, payable in current funds, on the day of sale, and the balance, within ten days thereafter, at the office of the Company. John Brisbin, President.

Messrs. Wm. H. Sayre, Jr., of Mauch Chunk, and Robert H. Jacob, of Huntingdon, Pa., have our thanks for favors received.

The following is the quantity of coal shipped over the principal roads for the week ending April 6, 1867:

	1866.		1867.		
	WEEK.	TOTAL.	WEEK.	TOTAL.	DECR'SE
Phil. & Reading R.R.	.....	.....	62,823	729,217	.....
Schuylkill Canal	.....	.....	23,021	68,148	.....
Lehigh Val. R. R.	29,185	525,823	34,985	336,030	129,730
Lehigh Canal	.....	.....	.....	.....	.....
Del & Hudson	.....	.....	65,285	65,285	.....
Scranton North	7,058	88,241	7,085	92,001	3,760
Scranton South	22,955	225,622	25,621	313,119	88,497
Penn'a. Coal Co. Rail	.....	99,593	19,420	139,712	40,119
Wyoming North	.....	.....	.....	.....	.....
Wyoming South	.....	.....	.....	.....	.....
Shamokin	8,954	92 912	11,783	85 045	4,868
Trevorton	.....	.....	114	4,397	.....
Short Mountain	.....	6,137	29	4,979	1,159
L. V. Co.	.....	2,740	1,252	7,498	4,758
Broad Top	.....	49,810	6,195	50,526	716
Williamsto'n	.....	.....	1,375	10,021	.....
Total	68,152	1,090,878	258,988	1,968,978	.....
Cor'ng time last year	.....	.....	.....	.....	.....
Decrease	.....	.....	.....	.....	.....

Report of Coal

Transported over the Lehigh Valley Railroad, Week ending Saturday, April 6, 1867.

Where Shipped from.	Week. Tons. cwt.	Total. Tons. cwt.
B. M. Region	5,892 07	110,237 04
Hazleton	10,464 14	39,325 03
Wyoming	7,862 06	131,621 08
Mahanoy	10,766 07	114,846 09
Total	34,985 14	396,030 04
Cor. week last year	29,185 00	525,823 06
Increase	5,800 14	.....
Decrease	.....	129,793 02
Coal delivered at M. Chunk and forwarded by rail	34,985 14	396,030,04
Coal delivered on line of P. Haven and W. Haven R.R.	10 06	89 06
At Mauch Chunk	5 00	107 05
At Junction, and at Mauch Chunk for shipment by canal	390 00	390 00
Grand Total	35,391 00	396,768 04
Cor. week last year	35,351 00	533,361 03
Increase	40 00	.....
Decrease	.....	136,562 19

Lehigh and Mahanoy Coal Trade,

For week ending April 6, 1867.

NAMES OF SHIPPERS.	WEEK.	TOTAL.
Trenton Coal Co.	.....	397 18
Mount Etna	.....	43 04
Mahanoy Coal Co.	950 03	2,511 13
Delano Colliery	1,538 00	20,146 05
Gleudon Coal Co.	543 05	5,711 10
Rathburn, Stearns & Co.	1 042 05	12,240 10
E. S. Silliman	2.039 18	29,992 18
McNeal Coal & Iron Co.	2.561 00	19,253 03
Knickerbocker Coal Co.	1,582 04	16,389 03
Thomas Coal Co.	184 02	5.094 17
Williams & Herring	41 01	3,589 04
Other shippers	.....	10 02
Total	10,481 18	115,384 07
Corresponding week last year	2.992 06	70,674 16
Increase	7,489 12	44,709 11
Decrease	.....	.....

Schuylkill Coal Trade.

BY RAILROAD & CANAL, FOR WEEK ENDING APRIL 6, 1867.

	Railroad.	Canal.
St. Clair	26 674	.....
Port Carbon	8,154	.....
Pottsville	60	.....
Schuylkill Haven	12,876	.....
Auburn	3,369	.....
Port Clinton	11,690	.....
Total for week	62,823	23,021
Previously this year	666,394	45,127
Total	729.217	68.148

Cumberland Coal Trade by Railroad.

Statement of Coal Shipments over the Baltimore & Ohio Railroad for the week ending April 6:

From Cumberland & Pennsylvania R. R.	Tons.
American Company	1.259 11
Consolidation Co.	3 336 02
Borden	1,680 10
From Eckhart R. R.	
C. C. & I. C.	615 15
Blaen Avon Company	328 03
Spruce Hill	417 01
Total	7,367 02
Gas Coal.	Tons.
From Mines West of Piedmont	1,910 00

No report from Piedmont.

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

At New York, April 12, 1867.

Schuylkill Red Ash, choice	$6 25@	$6 50
" Ordinary	5 50	6 00
" White Ash Lump	5 50	5 75
" Steamboat	5 50	5 75
" Broken	5 50	5 75
" Egg	5 50	6 00
" Stove	5 50	6 00
" Chestnut	4 75	5 00
Lehigh White Ash Lump	5 75	.....
" Broken	5 50	.....
" Egg	5 50	.....
" Stove	5 75	.....
" Chestnut	5 00	.....
Wilkesbarre Lump	5 25	.....
" Broken & Egg	5 50	.....
" Stove	5 75	.....
" Chestnut	5 25	.....
Wyoming Lump	5 00	.....
" Steamboat	5 25	.....
" Stove	5 50	.....
" Chestnut	4 75	.....

SPECIAL COALS.

Diamond Vein Red Ash, Schuylkill	6 25	.....
Locust Dale White Ash, "	5 75	.....
Honey Brook " " Lehigh	5 75	.....
Sugar Loaf " " "	5 75	.....
Room Run " " "	5 75	.....
Old Company's " " "	5 75	.....
Spring Mountain " " "	5 75	.....
Sugar Creek " " "	5 75	.....
Silver Brook " " "	5 75	.....
Fulton White Ash	5 75	.....
Stout	5 75	.....
Buck Ridge " Shamokin	5 75	.....
Spohn & Lewis	6 50	.....
Shenandoah	5 75	.....
Swatara Falls, Red Ash	6 00	.....
Henry Heils, E. Franklin, Lorberry	6 00	.....
Broad Mountain	5 50	.....
Wyoming	5 50	.....
McNeal Co.	5 75	.....
George's Creek (Balt.)	5 25	.....
" " (Georgetown)	5 00	.....
Locust Mountain (Reppher)	5 75	.....
Duncan Red Ash "	6 25	.....
Blossburg & Fall Creek	6 25	.....
Despard Gas Coal	9 00	.....
Westmoreland Gas Coal	10 00	.....
Wilkesbarre Coal & Iron Co.	5 50	.....

Agents for these Coals may be found in our advertising columns.

At Philadelphia, April 12, 1867.

Lehigh Lump and Steamboat	$5 25@	.. ..
" Broken and Egg	5 00	5 25
" Stove	5 00	5 25
" Chestnut	4 75	.. ..
Schuylkill Red Ash Prepared	5 00	5 50
" Chestnut	3 50	.. ..
" White Ash Lump and Steamboat	4 25	4 50
" Broken	4 25	.. ..
" Egg and Stove	4 25	4 50
" Chestnut	3 75	4 00
Locust Mt. Lump, and Steamboat	4 25	5 00
" Broken	4 25	.. ..
" Prepared	4 50	.. ..
" Chestnut	3 50	.. ..
Lorberry Coal	4 75	.. ..
Shamokin	5 00	.. ..
Franklin, (Lykens Valley)	5 00	.. ..
Broad Top	5 00	5 25

Scranton Coal at Elizabethport, April 12, 1867.

Lump	$4 50@	— —
Steamer	5 50	— —
Grate	5 50	— —
Egg	5 25	— —
Stove	5 50	— —
Chestnut	4 50	— —

Prices for Pittston Coal at Newburgh, April 12 1867.

Lump, per ton of 2240 lbs	$5 20	.. ..
Steamer, " " "	5 30	.. ..
Grate " " "	5 35	.. ..
Egg " " "	5 45	.. ..
Stove " "	5 70	.. ..
Chestnut "	4 40	.. ..

70 cents additional to New York.

Lackawanna at Rondout, April 12, 1867.

(Average contract prices for year.)

Lump	5 00	@.. ..
Steamer	5 10	@.. ..
Grate	5 30	@.. ..
Egg	5 40	@.. ..
Stove	5 55	@.. ..
Chestnut	4 60	@.. ..
Pea	4 00	@.. ..

Lehigh Coal at Elizabethport, April 12, 1867.

Lump	5 75@	.. ..
Steamboat and Broken	5 50	— —
Egg	5 50	— —
Chestnut	5 00	— —
Stove	5 75	— —

At Baltimore April 12, 1867.

Wilkesbarre & Pittston W. A. wholesale	$7 00@	$7 25
" " " retail	7 75	8 00
Lykens Valley & Sunbury R. A. wholesale	7 00	7 25
" " " retail	7 75	8 00

George's Creek and Cumberland Coal.

Run of mine, f. o. b. at Locust Point	$5 25@	.. ..
At Georgetown	5 00	.. ..

(From the Mercantile Gazette.)

At San Francisco. April 2, 1867.

Duty Bituminous $1.25. Other kinds 40 cents per ton

Australian	$12 00@	.....
Do Wallsend	12 00	13 00
Pittston, do	11 50	.. ..
Lehigh	17 00	.. ..
Cumberland, cks	.....	27 00
do bulk	23 00	.. ..
Scranton	14 50	.. ..
Liverpool	13 00	.. ..
Scotch	14 00	.. ..
West Hartly	14 00	.. ..
Vancouver Island	13 00	.. ..
Bellingham Bay	10 00	.. ..
California	6 00	8 00

Wilkesbarre Coal at Elizabethport.

Lump	5 00	.. ..
Steamer	5 25	.. ..
Broken	5 30	.. ..
Egg	5 30	.. ..
Stove	5 50	.. ..
Chestnut	4 75	.. ..

Prices of Provincial Coals.

[REPORTED FOR THE JOURNAL OF MINING.]
BY LOUIS J. BELLONI, JR., 43 Pine street, N. Y.
Duty $1.25 per ton.

Block House (on board)	$1 75	gold
Gownie "	1 75	"
Lingan "	1 75	"
Sidney "	2 25	"
Pictou "	2 25	"
Glace Bay "	1 87½	"
International Co.'s "	1 75	"
Slack Coal "	75@1 00	"

Prices of Foreign Coals.

[REPORTED FOR THE JOURNAL OF MINING.]
BY H. L. PARMELE & BRO., 32 Pine street, N. Y.
Duty $1.25 per ton.

Liverpool Gas Caking	$10 50
" " Cannel	13 00
" House "	16 00
" " Orrel	16 00

Per ton 2240 lbs.
PRICES FROM YARD:

Liverpool Orrell, screened	20 00
" Cannel, "	22 00

per ton 2000 lbs. delivered.

Coal Freights.

(Corrected Weekly.)

From Port Richmond, Philadelphia.

Albany (& towing)	$1 80@	—	—	Mahlen	3 20	—	—
Alexandria	1 60	—	—	Mobile	4 00	—	—
Amesbury Point	3 25	—	—	Neponsett	3 15	—	—
Appanoag	2 00	—	—	New Bedford	2 25	—	—
Aspinwall	—	—	—	Newburg	$1 65@	—	—
Bangor	2 75	—	—	Newburyport	3 15	—	—
Bath	3 00	—	—	New Haven	2 25	—	—
Baker's Landing	—	—	—	New London	2 25	—	—
Bedford	—	—	—	Newport	2 25	—	—
Belfast	3 00	—	—	Newport, R. I.	2 10	—	—
Boston	2 75	—	—	New York	1 45	—	—
" bridges	03	—	—	Norfolk	1 50	—	—
Bridgeport	2 15	—	—	Norwalk	2 08	—	—
Bristol	2 00	—	—	Norwich & tow	2 25	—	—
Calais	3 50	2 75		Pawtucket and tow	2 25	—	—
Cambridgeport	2 75	—	—	Petersburg	2 00	—	—
Catskill (& tow)	2 00	—	—	Philadelphia	—	—	—
Charleston, S. C.	2 25	—	—	Portland	2 75	2 85	
Charlestown	2 75	—	—	Portsmouth, N. H.	2 75	3 00	
Chelsea	2 75	—	—	Providence	2 25	—	—
Commercial Point	3 00	—	—	Provincetown	2 05	2 25	
Cohasset Narrows	2 75	—	—	Poughkeepsie, & tug	1 60	—	—
Daversport and dis	3 00	—	—	Port Chester	1 60	—	—
Daversport	3 00	—	—	Plymouth	2 25	—	—
Delaware City	— 80	—	—	Richmond, Va	2 25	—	—
Dighton	2 75	—	—	Rockland	—	—	—
Dover	2 90	—	—	Roxbury	2 75	3 00	
East Cambridge	2 90	—	—	Saugus	2 50	—	—
East Greenwich	2 25	—	—	Sing Sing	1 60	—	—
Elizabethport	—	—	—	St. Johns (in gold)	2 00	—	—
Fall River	2 25	—	—	Salem	2 75	—	—
Fort Monroe	1 60	—	—	Savannah, Ga	2 25	—	—
Fredericksburg	1 75	—	—	Stonington	2 25	—	—
Gardiner	3 00	—	—	Taunton	2 50	—	—
Georgetown	1 60	—	—	Washington, D. C.	1 60	—	—
Gloucester	3 00	—	—	West Point & tow	1 70	—	—
Greenpoint Towing	1 45	—	—	Wilmington	1 00	—	—
Hartford	2 75	—	—	Williamsburg	2 87	—	—
Lynn	2 75	—	—	Winterport	2 00	—	—
Milton	3 85	—	—	Yarmouth	3 12½	—	—

From Rondout.

River.			Eastern.		
Albany	50@	..	Boston	2 10@	..
Barrytown	35	..	Bridgeport	1 55	..
Catskill	40	..	Bristol	1 50	..
Cold Spring	30	..	Dighton	1 55	..
Coeymans	50	..	Fall River	1 50	..
Coxsackie	45	..	Mystic	1 40	..
Fishkill Landing	20	..	New Haven	1 30	..
Greenbush	55	..	New London	1 40	..
Haverstraw	45	..	Newport	1 50	..
Hudson	45	..	Norwalk	1 25	..
New York	65	..	Norwich	1 50	..
Nyack	55	..	Pawtucket	1 75	..
Peekskill	45	..	Providence	1 55	..
Poughkeepsie	30	..	Stamford	1 30	..
Rhinebeck	35	..	Stonington	1 40	..
Saugerties	45	..	Warren	1 55	..
Sing Sing	55	..			
Stuyvesant	50	..			
Tarrytown	55	..			
Troy	65	..			
West Point	35	..			
West Troy	60	..			
Yonkers	55	..			

From Newburgh.

River.	Co.'s Boats.		Eastern.		
Albany	50@	..	Boston	1 75@	..
Barrytown	35	..	Bridgeport	1 12½	..
Catskill	35	..	Bristol	1 40	..
Cold Spring	30	..	Dighton	1 45	..
Coeymans	45	..	Fall River	1 40	..
Coxsackie	40	..	Mystic	1 30	..
Fishkill Landing	20	..	New Haven	1 12½	..
Greenbush	50	..	New London	1 30	..
Haverstraw	45	..	Newport	1 40	..
Hudson	35	..	Norwalk	1 12½	..
New York	70	..	Norwich	1 40	..
Nyack	50	..	Pawtucket	1 65	..
Peekskill	40	..	Providence	1 45	..
Poughkeepsie	25	..	Stamford	1 12½	..
Rhinebeck	30	..	Stonington	1 30	..
Saugerties	35	..	Warren	1 45	..
Sing Sing	50	..			
Stuyvesant	40	..			
Tarrytown	50	..			
Troy	55	..			
West Point	30	..			
West Troy	55	..			
Yonkers	55	..			

From Elizabethport.

Albany	$1 00@	—	—	New London	1 25@	—	—
Boston	1 75	—	—	Newport	1 50	—	—
Bridgeport	1 00	—	—	New York	55	—	—
Fall River	1 50	—	—	Norwalk	1 00	—	—
Hartford	1 50	—	—	Norwich	1 30	—	—
Hudson	1 00	—	—	Pawtucket	1 75	—	—
Lynn	—	—	—	Portland	2 00	—	—
Middletown	1 25	—	—	Portsmouth	2 15	—	—
New Bedford	1 50	—	—	Providence	1 40	—	—
Newburyport	2 25	—	—	Salem	2 00	—	—
New Haven	1 00	—	—	Taunton	1 40	—	—

From Georgetown or Alexandria.

To Philadelphia	$1 60	—	—	Boston	3 00		3 25
New York	2 25		2 50	Sound Ports	2 75		3 00

From Baltimore.

To Philadelphia	$1 40@		1 50	Boston	3 00@		3 25
New York	2 25		2 50	Sound Ports	2 75@		3 50

Provincial Freights.

	Currency.
Sydney to N. Y.	$3 50
Lingan	3 75
Cow Bay	3 75
Big Glace Bay	4 50
Little "	3 75

Foreign Freights.

New Castle and Ports on Tyne	18£@ keel
Liverpool	11s.@ 12s.6d.

Rates of Transportation to Tide Water.

[BY RAILROAD.]

To Port Richmond.

Transportation from Schuylkill Haven to Pt. Richmond	$2 00
Freight from Pt. Richmond to New York	1 50
Total	$3 50
Drawback	50
	3 00

From Port Carbon 8 cents per ton more.

To Elizabethport

L. V. R. R. from Mauch Chunk to Easton	$ 81
C. R. R. of N. J., Easton to Elizabethport	1 22
	2 03
Shipping expenses at Elizabethport	28
Total	$2 31

To Port Johnson.

L. V. R. R.	$ 81
C. R. R. of N. J.	1 29
Shipping Expenses	25
Total	$2 35

To Hoboken.

L. V. R. R.	$ 81
Morris and Essex R. R.	1 29
Shipping Expenses	25
Extra to N. Y. or Hudson River Shipments	10
Total	$2 45

[BY CANAL.]

To Port Richmond.

From Schuylkill Haven to Port Richmond	$1 00
Freights and tolls by Raritan Canal	2 20
	$3 20
Drawback	20
Total	$3 00

To New York.

From Mauch Chunk to New Brunswick—

By Lehigh: Del. Div. and Del. and Raritan Canal	90
Freights through	1 25
Towage	22
	$2 37

To New York via Morris Canal.

Lehigh Canal	34
Morris "	50
Towage	10
Freight	1 45
Total	$2 39

Expenses from Mauch Chunk to Jersey City for Re-shipment.

Lehigh tolls (net)	34
Morris "	50
Freight	1 40
Re-shipping	41
Total	$2 65

BOSTON STOCK MARKET.

(By Telegraph.)

BOSTON, April 12, 1867.

Prices bid to-day were as follows:

Canada	40c.	Minnesota	..
Copper Falls	22	Quincy	26
Franklin	19½	Cary Improvement	8¾
Hancock	4⅞	Rockland	..
Huron	10	Water Power	26
Isle Royal	..	Central	..

Sales at Boston Stock Exchange, April 11.

100	shares	Allouez	5⅛	300	shares	Ophir Gold	2¼
50	do	Cary Imp	8½	SECOND CALL.			
850	do	Canada	45	6	shares	Franklin	19¼
25	do	Copper Falls	22⅛	25	do	do	19¾
50	do	Franklin	20	100	do	Eagle River	2¼
250	do	Hancock	5	1350	do	Humboldt	1¼
155	do	Huron	11	100	do	Isle Royal	6⅛
550	do	do	10¾	100	do	do b 30.	6¾
100	do	do b 30.	11	100	do	Pewabic	15⅛
100	do	Phœnix	5				

SAN FRANCISCO STOCK MARKET.

Latest by Telegraph.—April 11.

Name.	Bid per foot.	Name.	Bid per foot.
Gould & Curry	380	Crown Point	1300
Savage	2500	Yellow Jacket	1100
Chollar-Potosi	325	Belcher	150
Ophir	250	Alpha	190
Hale and Norcross	3500	Imperial per share	265
Cal. Steam Navigation Co.	63½	Cal. State Telegraph Co	30

Weekly Coal Trade Circular.

NEW YORK, April 12, 1867.

The Coal Trade remains very dull at wholesale, and is also quiet at retail. Prices are without change. Coal of choice quality sells with moderate activity at the quotations, whilst for medium and inferior grades the demand is not equal to the supply, and, as a consequence, prices are very irregular. It is very singular that there are still so many operators who cannot be made to realize the importance of sending their Coal to market in *first class order*. Vessels are quite scarce at Philadelphia for Eastern ports, which checks business. At export the supply is fully equal to the demand. The long strike in the Lehigh has terminated, the men yielding. This has been a very determined strike in the part of the men, but from the first it was apparent that the operators must conquer. P.

Special Notices.

The Steam Syphon Pump.

The Steam Syphon Pump is well worthy the inspection of all who have use for a device for raising water by steam. It is an independent force and lift pump, and throws a steady, continuous stream, without piston plunger, valves or movable parts of any kind. This pump has many features that recommend its use. It is simple and durable. It is an efficient fire engine wherever a steam boiler is used, and valuable for mining purposes where the height is not too great to which water must be forced. Address, Steam Syphon Company, 48 Dey street, New York.

Messrs. Hubbard & Whittaker's Machine Works.

Messrs. Hubbard & Whittaker manufacture superior high and low-pressure steam engines, boilers, hydraulic presses, shafting, pulleys, iron and brass castings, &c. Their works are well conducted, and among the most extensive in Brooklyn. We recommend such as desire to purchase a good steam engine to call there and examine the patterns, or send for an illustrated circular. Office and Works No. 102 Front street, Brooklyn.

James A. Robinson, Esq., 164 Duane street, this city, manufacturer of the Ericsson Calorie Engine and Pump, lately received the following testimonial:

HUDSON RIVER RAILROAD, SUPERINTENDENT'S OFFICE.
New York, January 30, 1867.

JAMES A. ROBINSON, ESQ.:

Dear Sir—In reply to your request of the 25th inst., I am pleased to state the result of our experience in the employment of the Ericsson Caloric Engines for "pumping." We have five of them in use, of 18 and 24 inch sizes, raising water different heights from 22 to 80 feet, and in one case drawing and forcing it more than 1,500 feet horizontally, in addition to the elevation. Our first engines have been in service about seven years. All have performed their work satisfactorily, more particularly those built at your Works, being more thoroughly constructed than our earlier ones (built by other parties), their cost of repairs is reduced to a trifling amount. We now use Caloric Engines exclusively at all stations where an independent power is required for supplying water. At different points we have substituted them for Steam Engines, with decided advantage in all respects.

My own judgment is that the "Hot Air Engine," as now constructed, its capacity being properly suited to its work, affords the most economical, and in every respect the best power attainable. It consumes much less fuel than the best Steam Engine. It is absolutely safe against explosion and self injury from "low water." Is much safer on account of fire. Has no feed pump nor pipes to freeze up, and become useless when not running. It requires no mechanical skill, and very little labor or attention to keep it regularly at work, and consumes far less time than steam to get in operation after starting fires. Another important advantage is that all the escape heat is easily utilized for warming Tank Houses or water without danger from fire. In short, I may say I consider the Caloric Engines better adapted for universal use than any prime mover known for work within its limits.

Respectfully yours,
A. F. SMITH, General Superintendent.

Liquid Fuel.

Practical trials, and experiments on an extended scale, have demonstrated beyond all doubt that petroleum is admirably adapted, as a substitute for coal, for the purpose of generating steam. But, notwithstanding the convincing proof we have had of this fact, we have not yet an example of an independent practical application. It is true the question of petroleum as a steam fuel is a comparatively young one, and, in such a case, it is always a hard matter to find any one who will take the initiative. Besides, there are prejudices to be overcome, and conflicting interests to be disposed of, and, until the way is clear in this respect, the most perfect method of effecting an improvement in any department of applied science is not likely to progress very rapidly. But the question which meets us at the outset, in the present case, is, Have we arrived at the most perfect method of burning liquid fuel? There are various systems by which it is proposed to effect this object, and there has been some deep thinking and hard working about the matter. But, although excellent results of the working of petroleum furnaces have been recorded by us, it is only within the last few days that we have felt an honest conviction that our question was answerable in the affirmative. This conviction has been reduced by a careful investigation of the working of a new method of burning petroleum in the furnace of a steam boiler, at a large works in Lambeth. The apparatus with which these trials are now being carried on—which we need hardly observe, forms the subject of a patent—is the invention of Messrs. Wise and Field, of the Adelphi, and Mr. Aydon: and, like most inventions possessing real utility, is very simple in its character. The principle consists in the use of petroleum or any other liquid fuel for raising steam by injecting it, by means of superheated steam, into the furnace. This is effected in such a way that it is vaporized and dispersed over the surface of the fire and its combustion completely effected. It will be seen from the engraving on page 78 that the construction of the apparatus used in carrying out this invention is by no means complicated. We show a section of the injector, to which the superheated steam is admitted through the pipe *i*. The admission of steam is regulated by a plug i^1 passing the ajustable nozzle i^2. The petroleum is admitted to the injector by the adjustable pipe *j*. A suitable quantity of air is mixed with the

steam and petroleum in their passage through the pipe k^2 to the furnace. This air is admitted through the opening k, and its amount can be regulated by means of the disc k^1, which can be raised or lowered at will. We have thus a stream or jet of superheated steam, air and petroleum, which is forcibly injected into the furnace through a pipe just above the fire-door. This jet impinges upon a bridge of fire-clay placed a couple of feet or so from the door. The fire-bars are covered with an iron plate, and on this a shovelful of live coal is placed for the purpose of igniting the jet of petroleum spray. The air required for the combustion of petroleum is admitted through openings in the fire-doors, there being no upward draught through the fire-gate. In the present instance the apparatus is fitted to an ordinary single-flued Cornish boiler; its attachment, however, involves no alteration to the furnace, except tapping a hole or two over the fire-door, and placing a sheet of iron on the fire-bars. In half an hour the apparatus could be cleared away, and the furnace be made ready for burning coal. In the trials we witnessed with petroleum the combustion was of the most perfect character. An intensely brilliant violet flame filled the space beyond the bridge, indicating the thorough decomposition of the constituents of the fuel, whilst the entire absence of smoke and unconsumed carbon added further testimony to the soundness of the principle upon which the invention is based. The result of the experiment, which lasted about two hours, was the evaporation of 19½ lbs. of water by every pound of oil used. During the trial the boiler supplied steam at 35 lbs. pressure to the engines driving the various machines on the works. The oil used was of the cheapest kind; in fact, we believe, only refuse. The apparatus requires but very little attention, and is completely under control, the flame being increased or diminished in intensity almost instantaneously by regulating the flow of oil or steam. We know what the maximum evaporation obtained from the best coal is, and when we find it more than doubled, as in the present instance, by the application of petroleum to a coal-burning furnace, what may we not expect when the principle is developed in a specially-constructed furnace and boiler? It is early times yet with the inventors, but they have succeeded in thoroughly mastering the principle of perfect combustion with, to a certain extent, imperfect apparatus. They have already achieved a success in burning petroleum in an ordinary furnace far beyond anything we had previously witnessed. Considering, therefore, the many advantages petroleum offers as a steam fuel, we may predict that, with a perfect development of the principle, and with a modified form of boiler, its application must rapidly become general.—*Mech. Magazine.*

MORE PRESS NOTICES.

[*From the Millbrook Messenger, (C. W.) March* 27, 1867.]

AMERICAN JOURNAL OF MINING.—In this *golden* age, no one, having taken the mining fever, can do without this valuable publication. Useful to all.

[*From the Southeast Missouri (Ironton,) Enterprise, March* 30, 1867.]

The AMERICAN JOURNAL OF MINING, published in New York City, by Western & Co., is among our most highly prized exchanges. The JOURNAL is a necessity to those of our citizens engaged in mining operations, and we hope to see it liberally patronized. Call at this office and see specimen copies.

[*From the Valparaiso (Ind.) Republican, March* 28, 1867.]

AMERICAN JOURNAL OF MINING.—This fine sheet, published at 37 Park Row, New York, by Western & Co., is very interesting to all concerned in mining. It has recently been enlarged to twenty pages, making it one of the largest papers in the country.

[*From the Prarie Telegraph, (Rensselaer, Ind.) April* 4, 1867.]

AMERICAN JOURNAL OF MINING.—This is a quarto of twenty pages. It is the largest and most comprehensive journal of mining on this continent, representing gold, silver, copper, iron, lead, coal, slate, oil and whatever else comes under the head of mining. Western & Co., New York; $4 per annum. This is an able scientific and historical journal, containing highly interesting statistics on everything pertaining to its great leading feature of mines and minerals.

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49TH AUCTION SALE.
80,000 Tons Scranton Coal,
ON WEDNESDAY, APRIL 24TH, 1867.
NEW YORK, April 12, 1867.
The Delaware, Lackawanna and Western Railroad Company will sell, by Messrs. John H. Draper & Co., Auctioneers, at the Company's Sales Room, 26 Exchange Place, corner of William street, New York, on Wednesday, April 24th, inst., at 12 o'clock, noon, **80,000 Tons of Fresh Mined Coal,** from the LACKAWANNA REGIONS, of the usual sizes, deliverable at their Depot, Elizabeth port, N. J., during the month of May, 1867.
The sale will be positive; each lot put up will be sold to the highest bidder; no bids, in any form whatever, being made for account of, or on behalf the Company. The conditions will be fully made known at the time of sale.
TERMS:—Fifty cents per ton, payable in current funds, on the day of sale, and the balance within ten days thereafter, at the Office of the Company.
3:3:x JOHN BRISBIN, President.

MESSRS. WILLIAM MULLANY AND GEO. W. ESSER, of the firm of Jno. White, Wholesale Coal dealer, No. 8 Wall street, New York City, and Mauch Chunk, Pa., retire from said firm to-day by mutual agreement.
The business of the firm will be settled by Jno. White, at No. 8 Wall street, New York City.
JOHN WHITE.
WILLIAM MULLANY,
GEO. W. ESSER.

The undersigned beg leave to announce that they have this day formed a copartnership under the style of JOHN WHITE & CO., for the purpose of conducting a General Wholesale Coal Business, at No. 8 Wall street.
JOHN WHITE,
LOUIS T. SNOW,
Late Treas. McNeal Coal & Iron Co.
New York, March 1st, 1867. 25-2.px

PUBLICATIONS.

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VOL. IV. NEW SERIES. 1867.

THE AMERICAN ARTISAN AND PATENT RECORD is a weekly journal devoted to the interests of Artisans and Manufacturers, Inventors and Patentees. It is published every Wednesday, at No. 189 Broadway (opposite John street), New York, by Brown, Coombs & Co., Solicitors of American and Foreign Patents. The proprietors of this journal respectfully announce that it is their aim to make it more instructive and interesting than any other similar periodical in the United States or Europe.

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TO INVENTORS AND OTHERS.—Notice is hereby given that the members of a Commission, acting under the authority of the Secretary of the Treasury, will meet in the City of New York at the Office of the Supervising Inspector of Steamboats, No. 23 Pine street, on the SECOND MONDAY in April proximo, for the purpose of examining and testing the merits of such inventions of a life-saving character as may be brought before them.

Said Inventions will embrace Boilers of Steam-engines, Anti-incrustators, Safety-valves, Steam-gauges, Water-gauges, Steering Apparatus, &c., &., &c.

Inventors may appear in person before the Commission, for the purpose of explaining their Inventions; but no expenses will be allowed under any circumstances. H. MCCULLOCH,
Secretary of the Treasury
WASHINGTON, D. C March 13, 1867. 26:2t

IMPORTANT TO IRON MASTERS.
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Jan. 1, 1867. 18:12:qp

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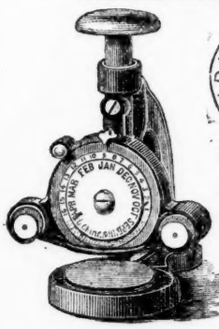

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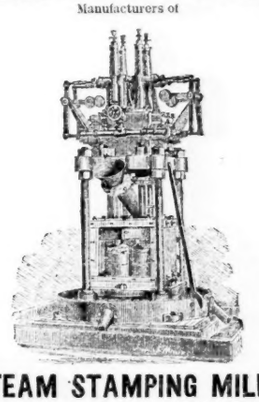

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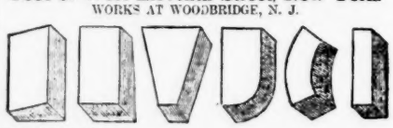

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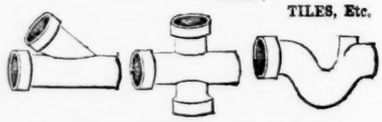

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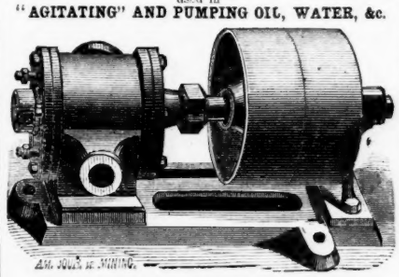

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MASKELL WM. PEACE,
Wigan, Law Clerk to the Association.
Feb. 11, 1867. 25:2:4t

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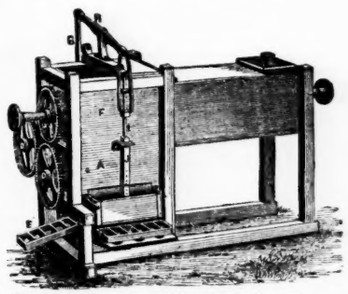

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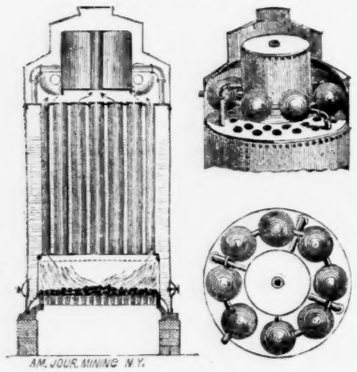

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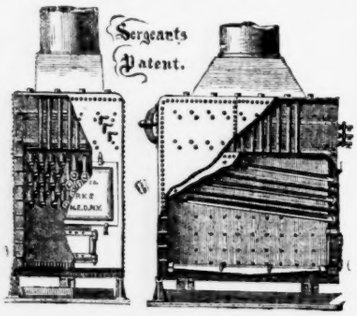

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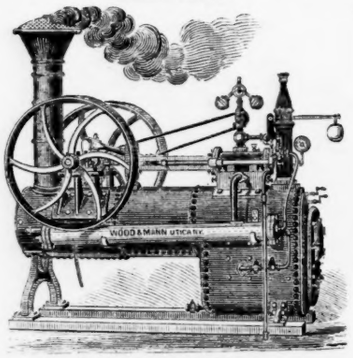

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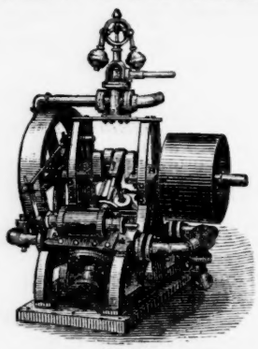

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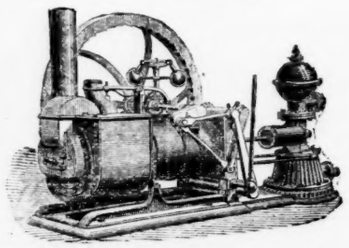

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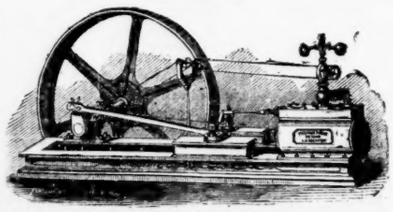

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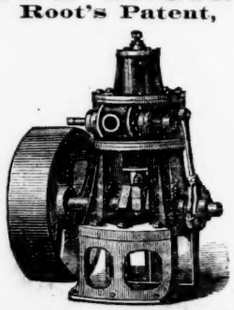

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